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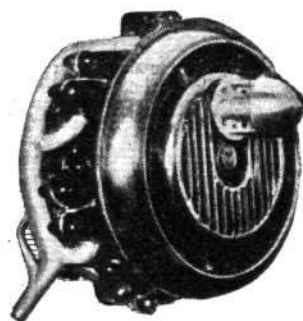


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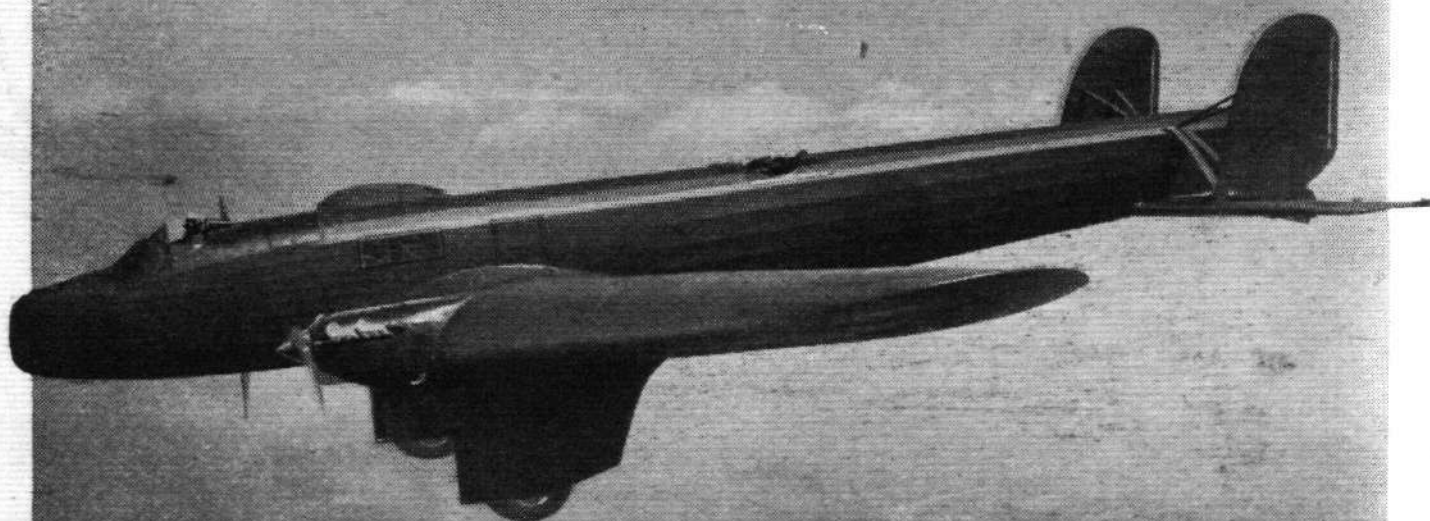
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Accelerate!

REPORTS from the most responsible correspondents at Stresa show that more was achieved there than had been expected. The unanimity of sentiment shown by the three greatest victor nations in Europe is certainly impressive, and ought to give pause to any mischievous Power which might contemplate a breach of the peace. No attempt of any sort was made to "ring" Germany; on the contrary, Germany is invited to join in any pact making for peace in which she is at all concerned. All the three Stresa Powers are unfeignedly anxious that Germany should co-operate fully in preserving the peace of Europe. During the Conference Sir John Simon received the welcome tidings that Germany has declared her willingness to enter into a pact of non-aggression in Eastern Europe. A pact of non-aggression is not the same thing as a pact of mutual assistance; it is much less of a guarantee of peace. The Anglo-French proposals recently made to Germany and others were for a pact of mutual assistance in Western Europe, and Germany had already said that she was willing to discuss that. Perhaps, after Stresa, she is more willing than she was before.

It has been suggested that Germany's offer as regards Eastern Europe is a bargaining move. Even if it were so, it would not be without value, or at least significance. It would suggest that Herr Hitler has been impressed with the solidarity shown at Stresa. Of recent years Germany has given the impression that the deity which she as a nation worships is Force, and that her national motto is "Might is Right." It is not easy to impress a nation in that frame of mind, but a manifestation of power in others is likely to have some effect. Any symptom of a desire on the part of Herr Hitler to bargain is therefore welcome as a contribution to the peace of Europe.

One very grave statement, however, occurs in the reports from Stresa. The diplomatic correspondent of the *Daily Telegraph* has written: "The statesmen of the

three Powers have been perfectly frank in recognising the great German superiority on the land and in the air over any other European Power. This superiority—judged on the dual consideration of numbers and efficiency—cannot be prevented in the near future, and has probably already been established." He added: "The most important outcome in England would appear to be a strong appeal to proceed much more rapidly with the building up of a fully efficient air force."

An Obvious Duty

In last week's leading article *Flight* advised withholding definite opinions until after Stresa, but that if that meeting had no definite result, then the question of accelerating the R.A.F. expansion programme ought to be very seriously considered. After this news of German strength in the air and on the land, we now join heartily with the correspondent of the *Daily Telegraph* in urging the acceleration of the programme. We do not urge this because war appears imminent. Fortunately for all, the results of Stresa seem calculated to postpone, at any rate, the imminence of a breach of the European peace. The reason for urging acceleration is that Britain ought not to tolerate a position of inferiority to Germany in the air, and because it seems beyond all doubt that a display of power is the only way by which to lead Germany under her present rulers to a peace-loving frame of mind. If it is correct, as the *Daily Telegraph* correspondent indicates, that "German aircraft now outrange and outpace the average British aircraft," our weakness may prove a temptation.

It is true enough, as Signor Mussolini said at a luncheon party during the conference, that "When England, France, and Italy can agree, there is hope for peace in Europe," but such an agreement would lack conviction if there were not strength behind it. Britain certainly cannot, and must not, be content to owe her safety to the numbers and power of the French and Italian aeroplanes. An unarmed ally is not an asset but a liability. It is Britain's duty to raise an Air Force which will command respect.

Speed Without Extra Cost

FAR too rarely does Capt. Geoffrey de Havilland let himself be persuaded to speak in public. Those who know him well realise that this is due to a rooted dislike of "limelight." But it is not necessary to be a personal friend to realise that, when he does come out of his shell, he invariably speaks very sound, hard common sense. Never has this fact been more amply demonstrated than by the paper which he read before the Royal Aeronautical Society last Monday. It deserves to be read by everyone interested in any way or capacity in the problems of commercial aviation.

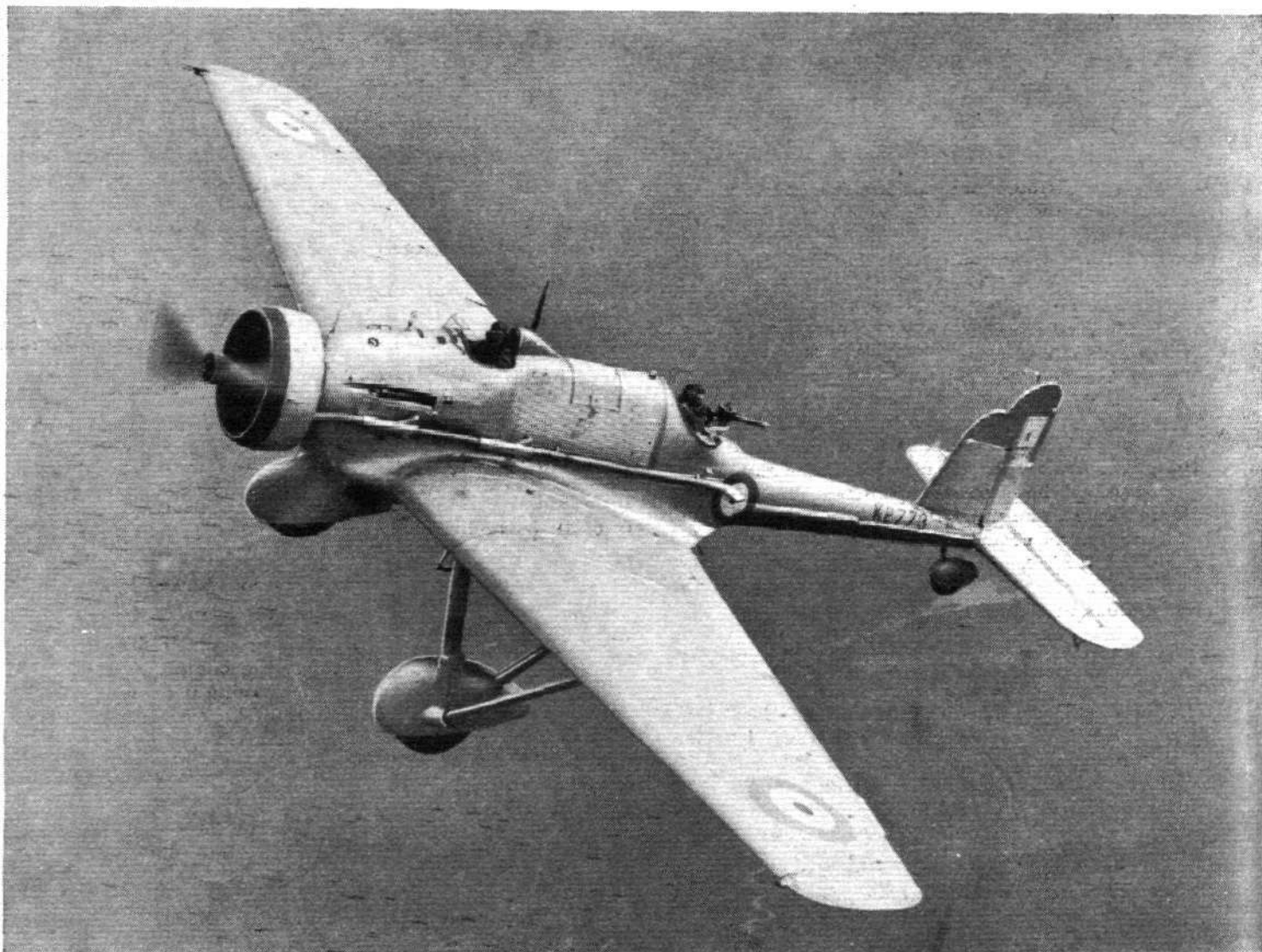
It is difficult to pick on any one aspect of Capt. de Havilland's paper and say that it is the most interesting; but, in view of the modern tendency towards higher speeds, those sections which deal with the problems of speed and cost of air transport are of particular significance.

There has always been a tendency to accept at its face value the oft-repeated statement that it is a fundamental law of aerodynamics that speed increases as the cube root of the engine power, and that because doubling the power brings an increase of only 26 per cent. in speed, much higher operational speeds than those to which we have become accustomed must of necessity be expen-

sive. Capt. de Havilland proved, we think to the satisfaction of most of those present, that this is not necessarily the case, and that with modern knowledge it is possible to achieve a very considerable speed-up *with no extra operating cost*, if cost is based on the product of speed and payload, or ton-miles per gallon of fuel.

Two assumptions are made in coming to this conclusion: That machines to be compared must have certain features or characteristics in common, such as ability to take off over the screen, or to fly with one engine stopped, and route operational conditions which permit of covering a correspondingly larger mileage per annum. The first cost per passenger seat will, Capt. de Havilland admits, be greater in the fast machine than in the slower, but operational costs will not.

It is well that this point should be established and made clear. Capt. de Havilland was, of course, speaking from the designer's point of view, and was careful to point out that it would be for the operator to decide when and in what conditions the faster machine could be introduced with advantage. No one else, obviously, is in a position to do so. Every route differs, in this respect, from every other route. A picture of the factors involved may, perhaps, be formed if one thinks of the possibility, on a certain route, of the fast machine being able to make two flights a day where the slower is able to make but one.



READY FOR MARTLESHAM. Capt. Cordes flying the new Handley Page 47 (Bristol "Pegasus") General Purpose machine. From the angle of the rudder and the general attitude it would appear that the machine was, at that instant, side-slipping slightly towards the Handley Page "Heyford" from which a *Flight* photographer took the picture. Other photographs and a description of this interesting newcomer are published on pages 411, 417 and 418.

The Outlook

A Running Commentary on Air Topics

The Inner Circle

ANYONE who has travelled unhappily by devious routes—whether by road or rail—between the various London airports will have learnt of the new inter-airport ferry service with joy. There must be quite a large number of people connected with the aviation business who will use the initial service between Croydon and Heston sufficiently often to make an extension of the system quite inevitable.

Even with the present internal and external airline system such a service is a useful luxury for air passengers, and before the 1936 season it should be an absolute necessity. To-day there are perhaps half a dozen good time-table reasons why, for instance, Essex Airport, Heston, and Croydon should be linked by frequent air services, which, of course, need not necessarily be particularly rapid over such a short distance. In fact, if the passenger list rises sufficiently there might be room for a type in which high speed has been made entirely subservient to carrying capacity and safety. Under the new zone system it will be extremely inconvenient for the pilot if his machine travels too quickly! Luckily, the first machine to be put in service has a fixed aerial only, so the complications of "winding-in" messages at least will be avoided.

Co-ordination

NOW that both Heston and Croydon have radio and D/F facilities and their own particular zones, the arrival of an inter-airport service should make it more convenient for internal services to use either Heston or Essex Airport, leaving Croydon entirely for dealing with the Continental services. Naturally enough, operators have chosen, and wish to be left to choose, their own bases, but in due course it will be essential, in the interests of tidiness, if not of safety, to make sure that each air line operates, as far as possible, in or from a single zone. As it is, Heston virtually controls all internal services once they are in the air.

Everything, too, points to the necessity for absolute co-ordination between the various operators, both in the matter of time-table planning and of through bookings. Already we are seeing definite examples of this in the direct or indirect linking of internal lines, and if these lines are to be of real value to the general community the co-ordination must be complete.

Unnecessary

WHILE appreciating the prominence which the B.B.C. gives in its news bulletins to aeronautical matters, one wonders if any good purpose is served by detailing, as was done last Friday evening, four or five fatal aeroplane accidents straight off the reel. One report was of a fatality to an English pilot in England, and was undoubtedly justified as news, and so was an account of the *Graf Zeppelin's* mooring mishap in Pernambuco; but the rest of the batch dealt with obscure accidents to unknown people in odd corners of Europe, and can have been of interest to few, if any, of the B.B.C.'s listeners.

The point of our disagreement is this: When John Citizen's wireless tells him that "a military aircraft in Upper Ruritania crashed to-day while giving a demonstration, both occupants being burnt to death," and then

follows it up with a string of other tit-bits of the same kidney (and a new selection the next evening), he can hardly be blamed for considering aircraft in general to be first-class death traps. The fact that Ruritania fighters may differ in some way from *Heracles* simply does not occur to him.

It is sad to reflect that the good work done by Mr. Filson Young's flying talks is thus cancelled out so unnecessarily.

Passenger Comfort

CAPT. DE HAVILLAND, in the paper summarised in this issue, rightly stresses the fact that the passengers' comfort should be studied. Far too often we find machines wherein the passengers are given what someone "thinks they ought to have" rather than the comfort they really want.

His remarks about chairs, cushions and windows are to the point, and we heartily endorse them, but when he states that he does not think that much can be gained by modifications to the engine and exhaust systems, or to the ventilation, we do not feel so much in accord with his views. Our experience makes us think that there is a great deal yet to be done in silencing engines. Already there are certain forms of silencer which, on some machines, have proved very efficient indeed. Capt. de Havilland naturally realises the great value of placing the engines so that they are shielded by the wings from the passenger cabin, but we can hardly believe that he does not think that even more benefit would accrue if the exhausts of those engines were silenced also.

Ventilation is largely a subject of individual taste. Many air travellers do not like the "individual jet" system advocated by Capt. de Havilland. A direct stream of cold air direct can be very uncomfortable on a bald head; nor can one sleep comfortably in the reflected draught from the jets on the opposite side of the cabin. Many favour the "total" system and, especially in view of the universal liking for air-conditioned trains and buildings, we cannot help thinking that the majority of people prefer having all the air in the cabin changed regularly and kept at a reasonable temperature, rather than being frozen on the top of their heads while their feet are parboiled.

"Knock-down" Aeroplanes?

SHORTLY after the end of the war *Flight* obtained the views of a large number of aircraft firms on the possibilities of supplying all the component parts of a light aeroplane "ready made," leaving it to the amateur constructor to do the actual assembly, much as amateur boat-building is carried out in America. At the time it was not thought advisable to proceed with such a scheme, but the introduction of the *Pou-du-Ciel* appears to create the possibility of reviving the suggestion. Already a French firm has been established in Paris for the purpose of selling some of the metal parts for the *Pou*, and there does not seem to be any reason why this should not be extended to include many or all of the wood components, leaving the amateur to put the bits together, a task which should not be beyond the ability of thousands of enthusiasts in these air-minded times.

One advantage of such a scheme would be that the bits and pieces could be manufactured under Air Ministry

supervision and inspection, if this should be deemed essential, and the only doubtful part would be the assembly. With carefully written instructions this risk should be very small. Incidentally, it is interesting to learn that the French Air Ministry has officially granted permission for *Pous* to be flown at recognised aerodromes when the ordinary traffic is not such as to cause any risk of mutual interference. So far the machine may not, apparently, be flown across country, not having a C. of A., but it is hoped that if the many examples now being built prove to be reasonably safe in the hands of amateurs, cross-country licences will be granted in the future.

Labelled

WITH some hesitation we venture a suggestion—probably not so novel as we imagine—to those aircraft manufacturers and operators who are setting themselves out to entertain and instruct the general public on Empire Air Day.

While the question-asking proclivities of the schoolboy are proverbial, the timidity of his father, who would like to ask questions but daren't, is less universally recognised. Many people will go unsatisfied on a technical point which interests them simply because they lack the courage to say "that thing there" to their expert guide. Thus the obvious idea is to put your best aeroplane in a prominent place and hang it all over with cards and arrows saying exactly what every major component is called and what it does, and why.

The only risk would be that some people's machines might afterwards be put into service without the decorations being removed, since they would look so much like part of the design.

The Flying Slotsman

BIG things sometimes have very small beginnings. Is the *Pou-du-Ciel* such a beginning? The question is prompted not so much by the way the "New Aviation" (*l'Aviation Nouvelle*) is spreading in France, but by the appearance in the latest issue of the Handley Page Bulletin of an artist's impression of a "medium-size air liner" constructed on M. Henri Mignet's principle. The drawings are too good to miss, and they are reproduced below.

Putting the engines on the rear wing would make for a quiet cabin, but one wonders whether the statement made, i.e., that the *Pou-du-Ciel* is "nothing more nor less than a large-size Handley Page slot," would hold good with this spacing of the wing. It is interesting to see that the front wing is provided with a leading edge slot. Perhaps the artist himself was a little doubtful of the slot effect obtained from his particular wing arrangement. If the super-efficiency of the Mignet arrangement discovered at St. Cyr, as recorded in *Flight* last week, is actually proved to exist, and can be combined with the clean design of the Handley Page *Pou*, aviation subsidies should

soon become superfluous! What the Handley Page company thinks of the Mignet *Pou-du-Ciel* idea is indicated by the following sentence from the Bulletin: "Whether all these probabilities will be realised and in what degree remains to be seen; but it is already possible to say positively that the Flying Slot is one of the most interesting aeronautical conceptions of recent years."

The truth sinks in but slowly. The first description of the *Pou-du-Ciel* in the English language was published in *Flight* as long ago as September 20, 1934. What is more to the point is that if the Mignet wing arrangement is indeed a Flying Slot, does it infringe Mr. Handley Page's patents, and if so, what does he intend to do about it? Heavy royalties imposed on amateur-constructed *Pous* would be a real hardship.

Airship Safety

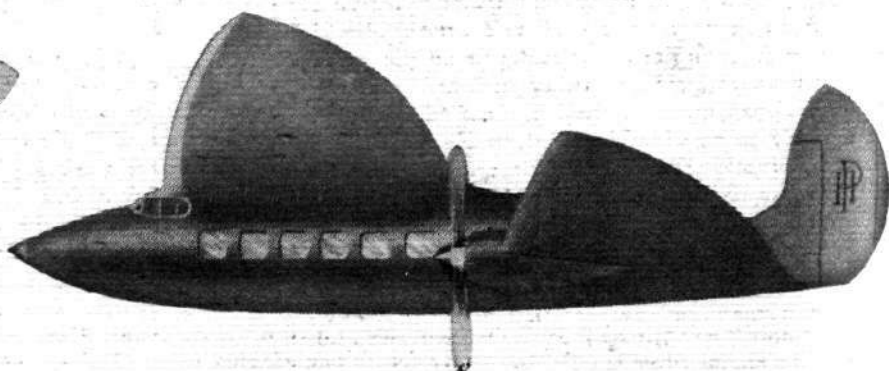
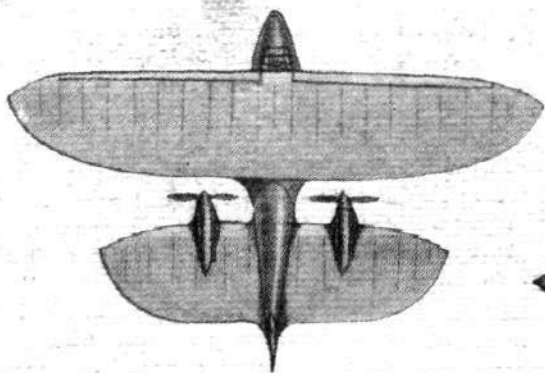
TO suffer one mild accident in some six hundred thousand miles is not a bad record, and the recent mishap to the *Graf Zeppelin* actually helps to prove the safety of the airship when in really capable hands. If a high-speed long-distance aeroplane had, through an error of judgment, touched a house while making a second landing circuit, the result would probably have been a complete catastrophe, and if structural failure had occurred in a large aeroplane, such as that which brought the *Macon* down into the Pacific, the result would have been equally catastrophic.

The fact that a lighter-than-air machine can be difficult when on the airborne borderline is no more a reason for damning the type than the fact that an aeroplane is tricky near the stall can be a reason for refusing to build any more aeroplanes. Only the German crews have had a chance of becoming as experienced with this particular craft as the average airline pilot is with his machine, and the whole secret of rigid airship success lies in the degree of experience possessed by the commander and his crew. What shipping company would dare to entrust a new luxury liner to a captain who had been on shore for the past five years or more?

Air Route "Records"

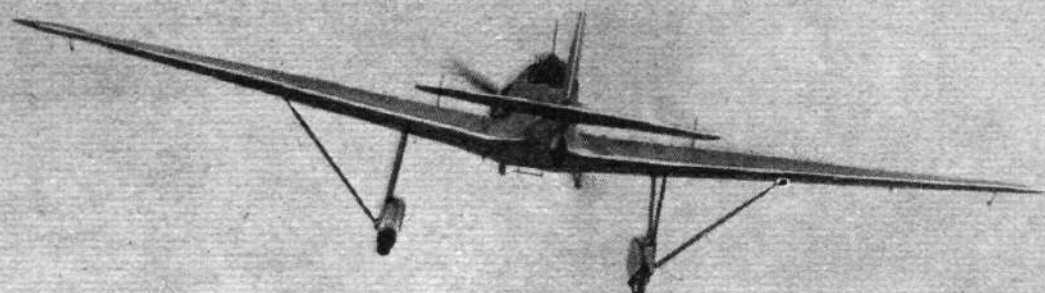
THE glut of air route "records" made with the help of generous following or beam winds has had at least one good result—the lay Press has seen fit to give the air lines a little useful publicity. Unfortunately, the prospective air traveller may expect to travel habitually to Paris or to Rotterdam at this sort of speed, and will consequently clamour for higher cruising speeds, obtainable at great cost to all concerned. Nobody gave the times in the reverse direction.

On the other hand, the French Government has made a good start with the first of their "Comets," which are, one understands, to be put on the South American route. We do not often have the chance of showing the world that we can build commercial machines that are every bit as fast and much more economical than many boosted American designs.

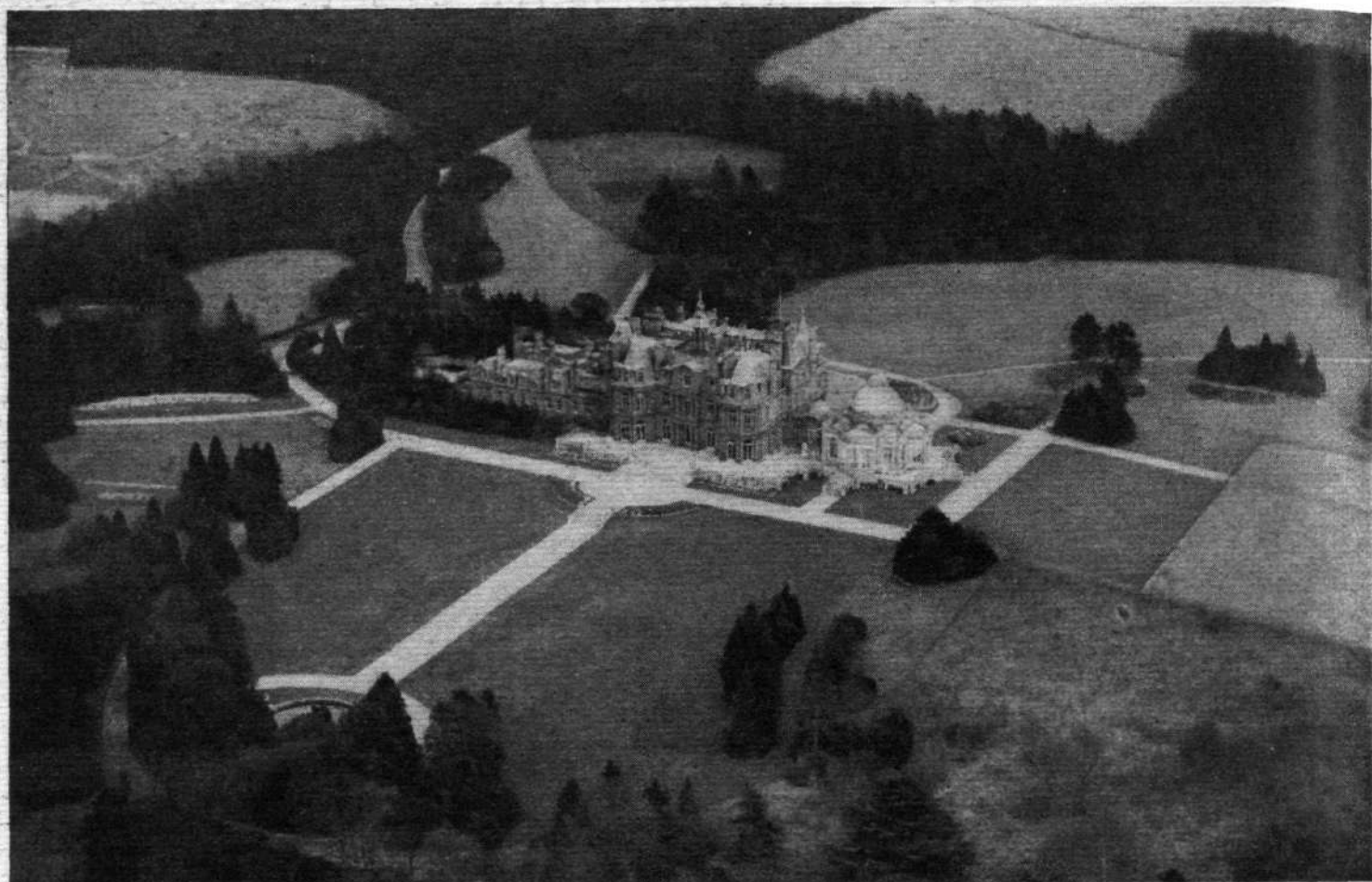


An overgrown *Pou-du-Ciel*—the drawings discussed in the column above.

MULTUM in PARVO



These three striking *Flight* photographs of the new Handley Page H.P. 47 General Purpose aeroplane show the clean aerodynamic design and small size, made possible by the utilisation to the fullest extent of leading-edge slots, slotted trailing edge flaps, and "interceptors" or "lift spoilers." The rear view, taken from a Handley Page "Heyford," shows the machine from an unusual angle. The engine fitted is a Bristol "Pegasus." Some notes on the H.P. 47, together with photographs of details, will be found on pages 417 and 418.

ROYAL AIR FORCE UNITS VISITEDThe Officers' Mess and Quarters. (*Flight* photograph.)

HALTON

No. 1. School of Technical Training (Apprentices)

By MAJOR F. A. de V. ROBERTSON, V.D.

HALTON CAMP is the official description of the tract of hill, woodland and meadow where the aircraft apprentices of the Royal Air Force are trained and educated. If the idea to be conveyed by the word "camp" is something dumped here and there without apparent rhyme or reason, with everything so contrived that the visitor who tries to find his way from one centre of activity to another is bound to lose his way—not only the way he is trying to go, but also the way by which he has come—then the word is amply justified. But if "camp" is taken to mean something temporary, something the reverse of *pukka*—tents, army huts, and such-like—then it is a very inadequate description of No. 1 School of Technical Training (Apprentices), Halton.

The heart of the place, namely, the officers' quarters and mess, was once one of the country palaces of the house of Rothschild. As the air photograph in the heading shows, it is an extremely imposing building, surrounded by handsome lawns and gardens, but the whole is concealed from distant view by the woods which surround it. The interior is ornate to a degree, in a style popular among the wealthy during part of the long Victorian era. The ceilings and part of the walls in some rooms are covered thickly with gold leaf. If this could be removed and melted down, as a vandal might suggest, it would perhaps cause a reduction in the next Air Estimates, but it has been put on too firmly to admit of easy removal. It never tarnishes and requires no cleaning, from which it may be argued that

there is an economy in building a house of pure gold.

The other buildings, the barracks, the schools, and the workshops, are also substantial, but are built in a somewhat different style of architecture. They positively reek of neo-Georgian utilitarianism and of Government construction. It is fortunate that there is plenty of room in Halton Camp, and that these specimens of modernism have not been erected cheek by jowl with the Rothschild palace. When one leaves the mess, one has to follow winding paths through woods and to cross roads until, when one reaches the workshops or schools, one would be puzzled to point out the direction of the mess.

The great virtue of Halton is that the position is splendidly healthy. It stands on the north-western edge of the Chiltern range, where the hills drop rather steeply down to the wide plain of the southern Midlands. By road it is about forty miles from London, and it lies in the county of Buckingham. No school is ever entirely free from epidemics, but, apart from these nuisances, the boys at Halton live in splendid air and inspiring surroundings which make for growth into strong, healthy men.

As an institution, Halton is a standing testimony to the high standard of technical skill required of aircraftmen in the principal trades of the R.A.F. For certain trades there is direct enlistment of men, and these men receive their training at the School of Technical Training at Manston, near Ramsgate. For the principal trades, however, those of fitter, fitter (armourer), instrument maker, and

wireless operator mechanic, the R.A.F. catches its tradesmen young and trains them up in the way it would have them go. The Electrical and Wireless School for apprentices is at Cranwell, but by far the largest school is Halton, and there all but the wireless operator mechanics and instrument makers receive their training. Boys who are accepted for training at either of the two schools, Halton and Cranwell, may count themselves very lucky indeed. Boys when they enter Halton must be between the ages of fifteen and seventeen, and normally they spend three years at the school. In that time they receive thorough training in a trade, and also a sound general education, while they get every opportunity to take part in all the regular games which boys love—cricket, Rugby, soccer, athletics, etc. The sports fields are extensive, and there is quite a forest of goal posts on them.

Of course, everything is found for the apprentices. They are not only housed and fed and clothed right well, but also receive pay, one shilling a day during their first two years, and eighteen pence a day afterwards until they pass out as aircraftmen. They receive religious instruction from the chaplains of the several denominations, and there is an institution called the Halton Society which organises all out-of-school activities except sport, model aircraft, and engineering, which are run separately. More of the Halton Society hereafter. A boy who is accepted for Halton—and only boys of good educational standard can expect to be taken—may feel sure that he has before him



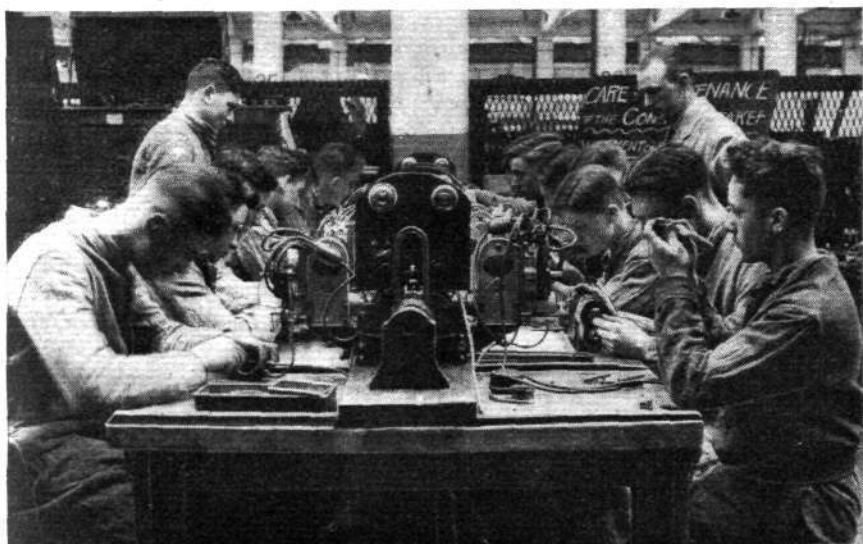
The Apprentices' Library, in which practically all books bearing on their work can be found, as well as a good store of sound fiction. (*Flight* photograph.)

three very good years which he will thoroughly enjoy.

Parents who are thinking of entering their boys for Halton will first want to know all about the prospects and liabilities. As stated above, the age for entry is between fifteen and seventeen, and the average period of training at Halton is three years. On entry into Halton each apprentice has to "attest" (which means promise to serve) for twelve years from the age of eighteen to that of thirty. He is then trained in one of the trades, of which the largest and therefore the most important is fitter. On passing out from Halton he is ranked as Aircraftman 2nd class, Aircraftman 1st class, or Leading Aircraftman. The daily pay of an A/C.2 is 3s. 6d., of an A/C.1 4s. 3d., and of a L.A/C. 5s. 6d. After three years' service the L.A/C. rises to 6s. a day. Besides the ordinary prospects of promotion to non-commissioned officer and warrant officer, there are chances of the aircraftman becoming an airman pilot with the rank of sergeant. A very few receive direct commissions from the ranks. A limited number of aircraftmen, after completing their twelve years' service are allowed to re-engage to complete twenty-four years, and then become eligible for pension. Those who pass to the Reserve after twelve years' service receive a gratuity of £100. A still more attractive prospect than that lies before Halton apprentices. Each year a very few of the outstanding apprentices are given cadetships and pass to the R.A.F. College at Cranwell, whence they emerge as officers on the general duties branch of the Royal Air Force.

How to Get In

There are two methods of entering Halton, by competitive examination and by direct entry. The competitive examination is held twice a year at numerous local centres, and competitors must first obtain a nomination from a local education authority, an advisory committee for juvenile employment, a governing body of an approved school, the council of the Boy Scouts Association, the County Territorial Force Association, the British National Cadet Association, or the Ministry of Education



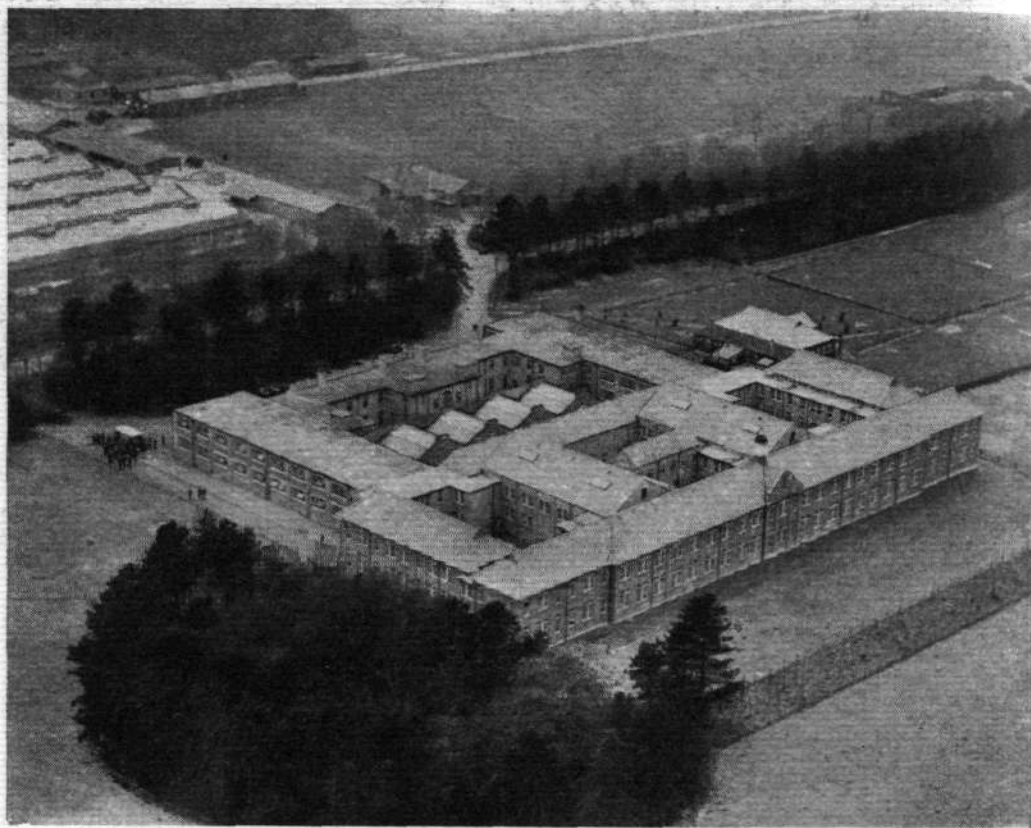
Two scenes in the workshops; the upper picture shows a class learning the faults which may occur in a magneto, and the lower one illustrates repairs to metal floats of a seaplane. (*Flight* photographs.)

for Northern Ireland. Candidates who hold an approved first school certificate with certain "credits" may be excused the competitive examination. Boys whose fathers are or have been sergeants (or above) in the R.A.F., R.F.C., or R.N.A.S. (equivalent rank in the last case) may sit as "Service" candidates. They will only be required to qualify in the examination, showing that they have reached a certain standard of education. They must, however, obtain a nomination from one of the authorities mentioned above.

The apprentices must be prepared to work hard. Work each day starts with a "colour-hoisting parade" at 8 a.m. Then the apprentices have a busy day in the workshops. First they have to acquire the manual skill necessary in a mechanic, and they also receive "basic" instruction in preliminary engineering, air-cooled and water-cooled engines, magnetos and carburettors, instruments, rigging and splicing (metal), fabric work, float repairs, aerodrome work, etc. In addition, eight hours a week are given to general education, and nine hours to physical training, organised games, and drill. The general education includes English, history, geography, mathematics, and aeronautical science. This is carried out under a highly qualified staff of civilian education officers. Games, of course, are considered of great importance, and it may be recalled that not many years ago an aircraft apprentice played as threequarter for the R.A.F. Rugby XV in the Inter-Services Tournament.

The Social Side

Now for a few words about the Halton Society. It is governed by a committee of which the Air Officer Commanding Halton is chairman. In addition to the committee of officers, there is an advisory committee of apprentices, which is elected by the boys. The Society arranges

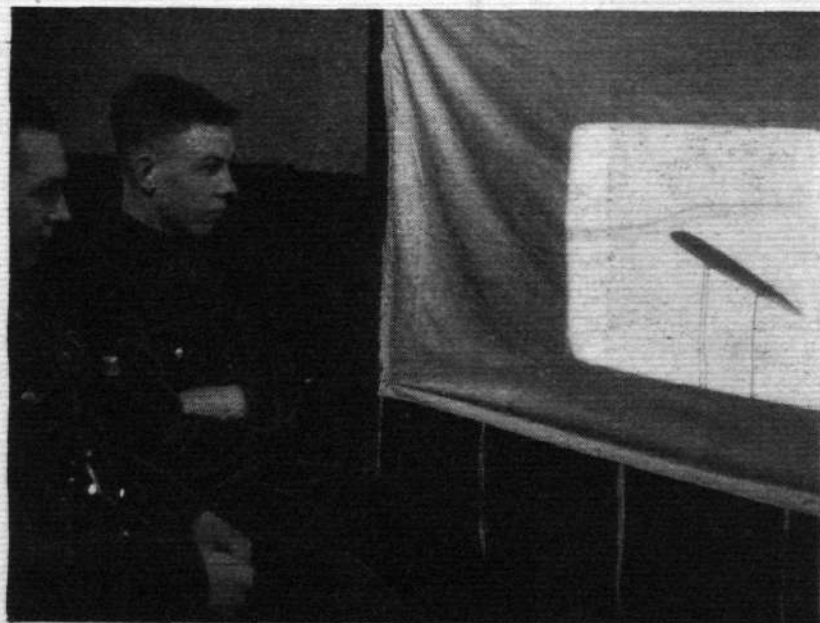


The schools in which general education is given to the apprentices by a staff of education officers. The workshops are in the background. (*Flight* photograph.)

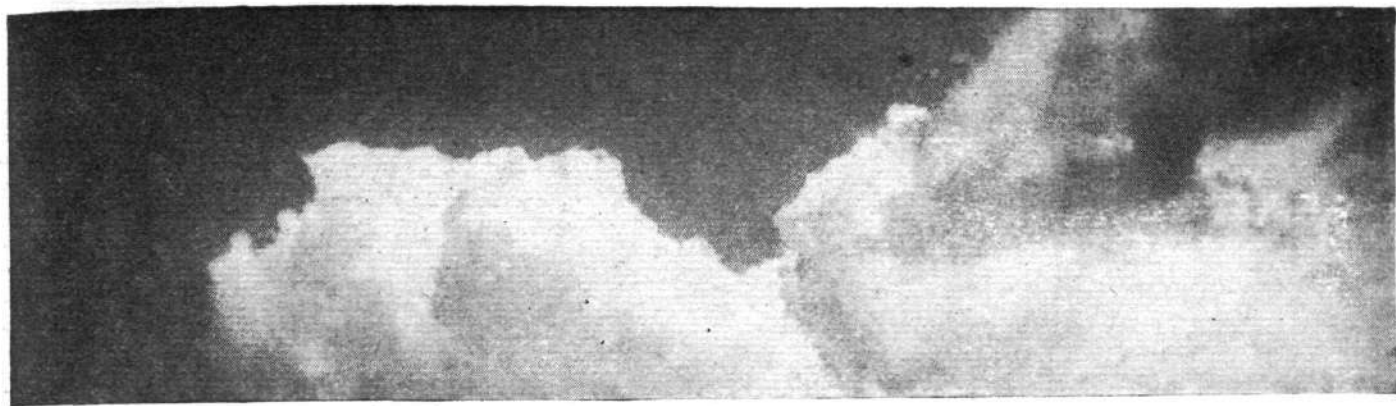
lectures, debates, theatricals, camping, trips, and foreign tours. It also arranges two big dances for the boys at Christmas and midsummer, to which ladies are invited and come. There is an art section which is affiliated to the Air Force Artists' Association, a chess section, a philatelic section, and a music section. These meet every week. The Society belongs to the Camping Club of Great Britain and Ireland, and week-end camps are arranged in the summer term. Trips are arranged to aircraft factories, and also to universities, to Rugby matches at Twickenham, and to Greenwich Observatory. Over a hundred apprentices were taken to Mildenhall to see the start of the race to Australia. The lectures and debates are very popular. Lectures have been given by such diverse personalities as the late Bishop of Ripon, the late Edgar Wallace, the late G. Watkins, F. S. Smythe, Mrs. Victor Bruce, Sir Stanley Reed (late Editor of the *Times of India*), "Ole Luk Oie," A. Courtauld, Sir Arnold Wilson, Allan Monkhouse, and H. M. Abrahams (the Cambridge athletic Blue). Each year a tour to Belgium is organised and is extremely popular.

The buildings at Halton were originally intended to house 3,000 apprentices, but in recent years, while the R.A.F. was kept small, there have not been more than 1,200 in residence at one time. Every January and August 360 new apprentices have been taken in, but, now that the Air Force is to be expanded, the total in residence is to be raised to 2,550. In the meantime, however, some of the spare room at Halton has been used for a refresher course for aircraftmen, and there are usually some 500 of them in residence. They are accommodated separately from the boys, and so space is now short. The question of erecting extra buildings is under consideration.

The apprentices are at present organised in two Wings, distinguished by the colour of the bands round their caps. One Wing has green cap bands, and the other has red. This division is only for convenience of organising the work and games, and also for promoting healthy rivalry. Both Wings are put through the same curriculum.



A remarkable photograph taken in a darkened room: apprentices watching the flow of smoke round an aerofoil, projected by a lantern on to a screen. (*Flight* photograph.)

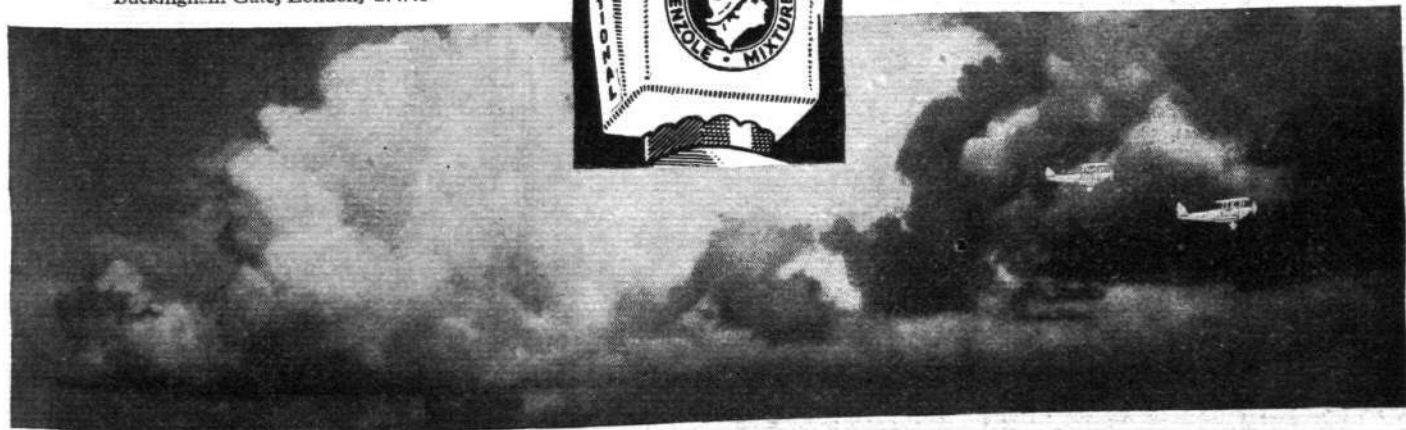


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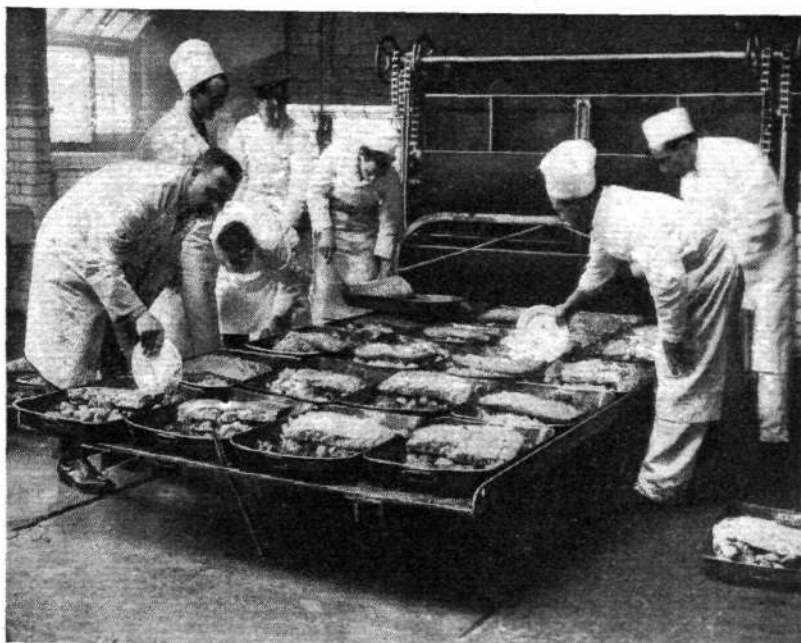
The work of Halton is rightly considered of such great importance that Royal Air Force, Halton, is a separate Command in the United Kingdom, and is under an Air Officer. The present A.O.C. is Air Commodore J. T. Babington, C.B.E., D.S.O., who is assisted by a large staff. In addition to the whole business of training and educating the aircraft apprentices, Halton has a hospital which is the centre of the Medical Branch of the R.A.F., and it contains also a school of cookery. Certainly the kitchens are a model of what such places should be, and the food supplied to the apprentices is of the best.

Inner boy and outer boy are equally well cared for. A trade is taught which can be followed when the aircraftman is discharged after twelve years' service. His brain is developed by education in special and general subjects. His character is brought out by the general healthy atmosphere of the place, and his tastes are stimulated by the variety of interests offered. If the apprentice does not turn out a successful man he will only have himself to blame. A visit to this camp is a most interesting experience, and the chief impression which the visitor carries away with him is that the boys who secure admission to the school are extremely lucky fellows.

ROYAL AIR FORCE SQUADRONS

Other descriptive articles concerning the work of various R.A.F. Squadrons, etc., have been published in *Flight* as follows:—

H.M. Aircraft Carrier *Glorious*. May 16, 1930.
No. 4 (Army Co-operation) Sq., (South Farnborough); No. 17 (Fighter) Sq. (Upavon); and No. 33 (Bomber) Eastchurch. June 27, 1930.
No. 601 (County of London) (B.) Sq., A.A.F. (at Lympe). August 15, 1930.
No. 43 (Fighter) Sq. (Tangmere). September 19, 1930.
No. 2 (Army Co-operation) Sq. (Manston). December 19, 1930.
No. 101 (Bomber) Sq. (Andover). April 24, 1931.
Nos. 204 and 209 (Flying-Boat) Sq. (Mount Batten). June 12, 1931.
"1890-1912-1931." (An outline of the Growth of the R.A.F.) June 26, 1931.
Cambridge University Air Sq. (at Old Sarum). July 10, 1931.
Central Flying School (Wittering). July 17, 1931.
Submarine Aircraft Carrier "M.2." July 31, 1931.
Oxford University Air Sq. (at Eastchurch). August 7, 1931.
No. 600 (City of London) (Bomber) Sq., A.A.F. (at Tangmere). August 21, 1931.
No. 605 (County of Warwick) (Bomber) Sq. (Cas. Bromwich). April 1, 1932.
No. 40 (Bomber) Sq. (Upper Heyford). May 13, 1932.
Nos. 7 and 58 (Bomber) Sq. (Worthy Down). June 10, 1932.
A visit to H.M.S. *Exeter* of 2nd Cruiser Squadron, Home Fleet. June 17, 1932.
Oxford University Air Sq. (Eastchurch). July 22, 1932.
Cambridge University Air Sq. (Netheravon). August 5, 1932.
No. 1 Air Defence Group (A.A.F. and Cadre Sqs.). August 12, 1932.



The model kitchens at Halton, in which the sergeant cook and his assistants take obvious pride. The roast beef, Yorkshire pudding and vegetables looked and smelt most appetising. (*Flight* photograph.)

No. 100 (Bomber) Sq. (Donibristle). August 19, 1932.
Scotland's Auxiliaries; No. 602 (City of Glasgow) (Bomber) Sq. and No. 603. (City of Edinburgh) (Bomber) Sq. September 16, 1932.
London Auxiliaries; Nos. 600, 601 and 604 B. Sq. October 20, 1932.
No. 25 (Fighter) Sq. (Hawkinge). December 8, 1932.
No. 19 (Fighter) Sq. (Duxford). January 5, 1933.
H.M. Aircraft Carrier *Courageous*. January 12, 1933.
Lee-on-Solent. February 9, 1933.
No. 23 (Fighter) Sq. March 2, 1933.
Gosport. The Fleet Air Arm Base. March 30, 1933.
Larkhill. R.A.F. Balloon Centre. June 8, 1933.
The R.A.F. Staff College, Andover. July 20, 1933.
No. 99 (Bomber) Sq. (Upper Heyford). August 3, 1933.
No. 26 (Army Co-operation) Sq. (Catterick). August 10, 1933.
No. 3 Flying Training School, Grantham. August 17, 1933.
No. 1 (Fighter) Sq. September 7, 1933.
No. 207 (Bomber) Sq. October 12, 1933.
No. 502 (Ulster) (Bomber) Sq. November 23, 1933.
North Coates Fitties No. 2 Armament Camp. December 21, 1933.
No. 14 (Bomber) Squadron. January 18, 1934.
Calshot Seaplane Training Squadron. March 15, 1934.
No. 201 (Flying Boat) Sq. (Calshot). April 12, 1934.
Cranwell. June 14, 1934.
No. 501 (B) Sq. September 13, 1934.
School of Army Co-operation, Old Sarum. November 20, 1934.
No. 16 (Army Co-operation) Sq. (Old Sarum). January 17, 1935.
H.M.S. *Leander*—No. 407 (Fleet Fighter) Flight. February 21, 1935.

THE "DRONE" IN ENGLAND

Mr. Robert Kronfeld, the famous Austrian gliding expert, is now permanently resident in this country. As managing director of B.A.C., Ltd., of which Lord Sempill and Mr. E. C. Gordon-England are directors, he will develop the "Drone," which was first produced by Mr. Lowe-Wylde. The machine will be fitted as standard with a Douglas touring motor cycle engine, developing 16 h.p. at 2,900 r.p.m. Its maximum output is 26 h.p.

The cruising speed of the "Drone" is about 50 m.p.h., the maximum 64 m.p.h., and the landing speed in the neighbourhood of 26 m.p.h. In France and Belgium the machine has found great favour; one school uses it exclusively.

On Saturday Mr. Kronfeld made a cross-country flight from Hanworth to Whitchurch, Bristol, flying the 120 miles in about an hour and a half. Special permission for the flight was granted by the Air Ministry.

Forthcoming Events

Club Secretaries and others are invited to send particulars of important fixtures for inclusion in this list.

May (Date not yet fixed). Wilbur Wright Lecture, R.Ae.S. by Mr. Donald W. Douglas.
May 5. R.Ae.S. Garden Party, Fairey Aerodrome, Great West Road.
May 11. Aviation Day, Phoenix Park, Dublin.
May 19. Deutsch de la Meurthe Cup, Aero Club de France.
May 23. Jubilee Air Ball, Air League of the British Empire, at the Dorchester Hotel, London.
May 25. Empire Air Day, Air League of the British Empire.
May 29. Household Brigade Flying Club. Night-Flying Demonstration, Heston.
June 1. Brooklands "At Home."
June 1-15. Lisbon Aero Show.
June 8. London Aeroplane Club. Garden Party, Hatfield.
June 8. Official opening and garden party, Witney and Oxford Aero Club.
June 15. R.A.F. Flying Club Annual Display, Hatfield.

June 15. Bristol & Wessex Aeroplane Club, S.B.A.C. Challenge Cup, Whitchurch.
June 16. Scottish Flying Club Display, Renfrew.
June 29. Royal Air Force Display, Hendon.
July 1. S.B.A.C. Display, Hendon.
July 13. Opening of Leicester Municipal Airport.
July 20. Opening of Brighton, Hove and Worthing Municipal Airport, Shoreham.
July 28. Private Owners' Garden Party, Ratcliffe, Leicester.
Aug. 24-25. Third International Flying Meeting, Lympe.
Aug. 24-25. Cinque Ports Club. International Flying Meeting and Wakefield Cup Race.
Sept. 6-7. King's Cup Air Race.
Sept. 14. Cinque Ports Club. Folkestone Aero Trophy Race.
Sept. 15. Gordon Bennett Balloon Race, Warsaw.
Oct. 12-28. International Aircraft Exhibition Milan.

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS



PERCH PRO TEM : Miss Naomi Heron-Maxwell on the parachutist's platform of **£i:** A an Cobham's Handley Page "Clive," from which she performs pull-off drops. A report of the opening National Aviation Day Display appears on pages 427 and 428. (*Flight* photograph.)

The Pobjoy Aeroplane

The new Pobjoy aeroplane, to which reference has already been made in *Flight*, is to be called the "Pirate," and have the registration letters G-ADEY.

Glide in Comfort!

Two passengers and a 600 lb. load can be carried in a new Russian cabin-type glider. It is equipped for day and night flying.

A Spanish "Autogirodrome"

It is likely that a ten-storey building with 65,000 square feet of roof space for the use of Autogiros will soon be built in Madrid. The ground floor is planned as a central bus station and the basement will be a railway terminus.

Bull!

At the All-Union Parachute Jumpers' Festival to take place in Moscow in August a large target, 328 ft. in diameter, will be painted on the aerodrome. The closer a jumper lands to the "bull's-eye" the more points he will receive. Another novel jumping event will be for accurate delayed-opening leaps. Each contestant will make two jumps, jerking the ring the first time five seconds, and the second time ten seconds after leaving the machine; each tenth of a second earlier or later than the specified time will cut his score. Russian parachutists intend to hold a contest for accurate jumping at night, when the target will be lighted by lanterns.

Lido Landings

A new airport known as the San Nicolo has lately been inaugurated at the Lido, Venice, Italy.

Eggs in One Basket?

The Royal Aeronautical Society is sponsoring a scheme, now under consideration, for the construction of a large building near Piccadilly, to be known as Air House. If plans materialise, the leading aeronautical bodies and most of the aircraft firms will have offices in the building, which is intended to be the highest in London.

Keeping it Dark

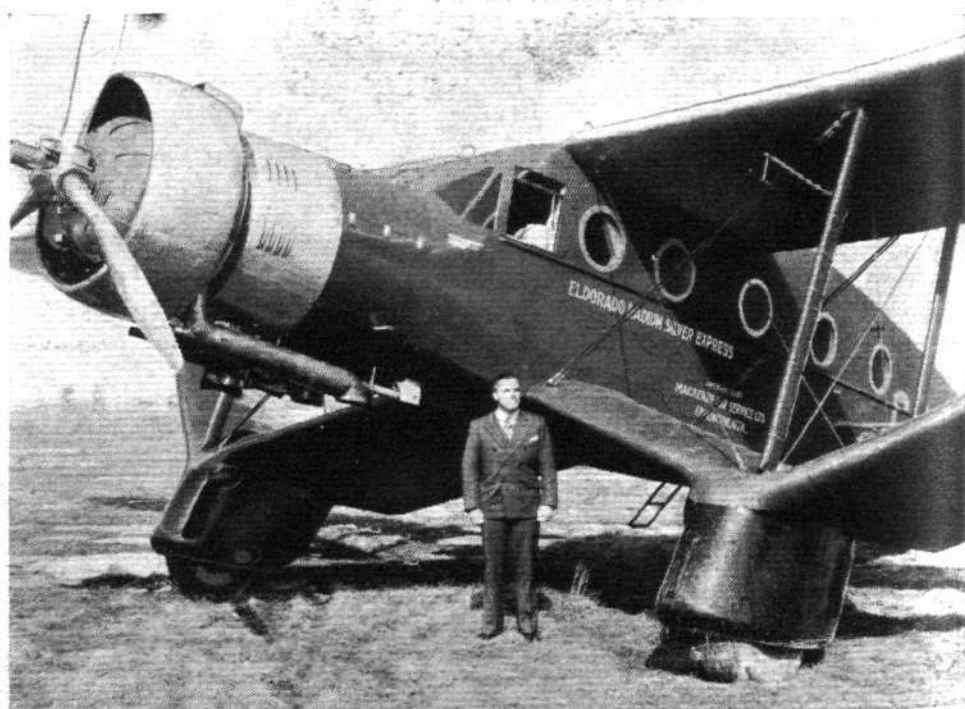
Secret-service men are reported to have smashed the cameras of Press photographers who endeavoured to take photographs of the big new Douglas XP3DI flying boat. *Flight* understands that the machine, which has a span of about 100 ft. and is fitted with two 830 h.p. "Twin Wasps," carries a crew of eight, and roughly two tons of bombs.

A 700-mile Tow

With an Avro 504, flown by Capt. J. D. King, providing the tractive effort, Miss Joan Meakin was towed last week in a German-built glider from Germany to Heston, where she was welcomed by a "reception committee" of ten machines. Landing en route at Lympne, Miss Meakin had a little trouble; the towing cable tore down twenty-eight telephone wires, and, in addition, she had to pay about £30 Customs dues.

A Polish Acquisition

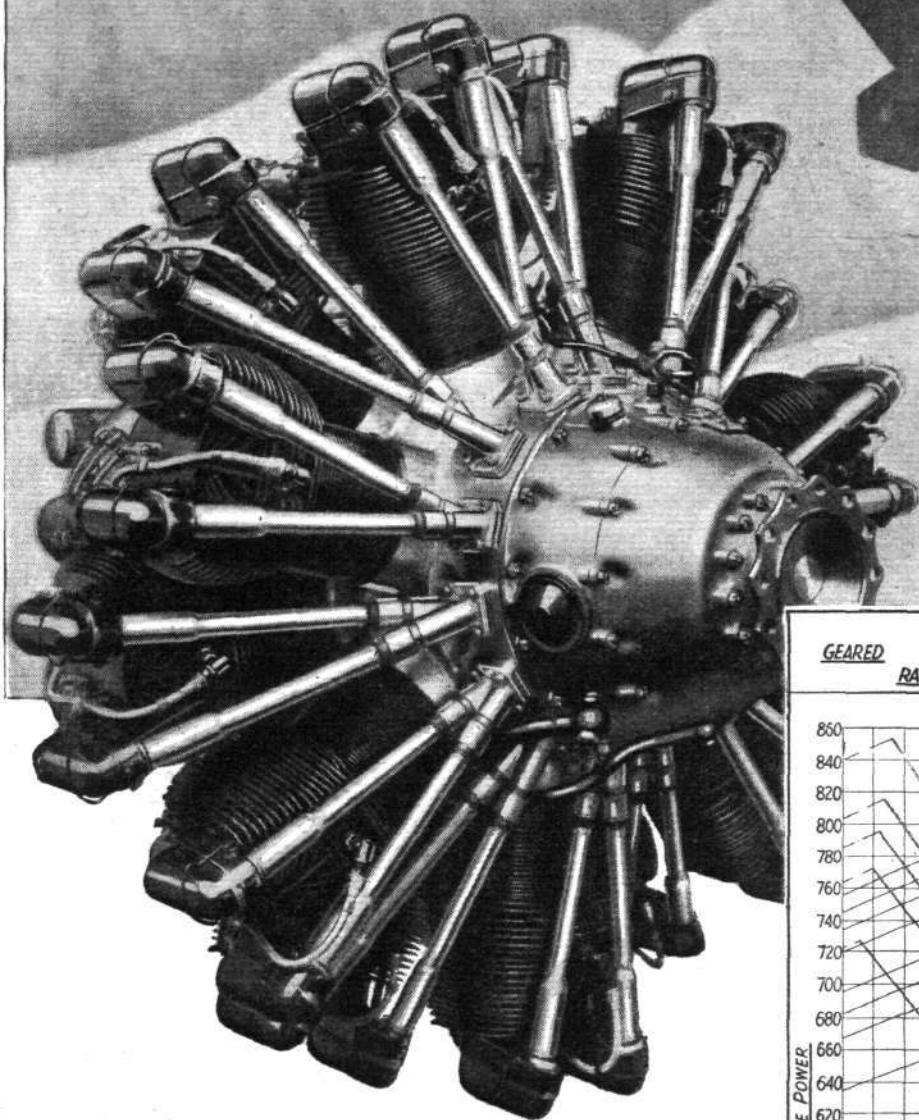
The Czechoslovakian Skoda Works have sold their aircraft factory at Okenice, in Poland, to the Polish State.



THE TRIAL OF '35 : A new Bellanca "Cargo Aircruiser," with a 700 h.p. Wright "Cyclone" engine, which has been delivered to Mackenzie Air Service, Ltd., the Canadian company, for work in connection with silver mining. The company's president, Mr. Leigh Brintnell, is here seen beside the new acquisition, of which he is also the pilot.

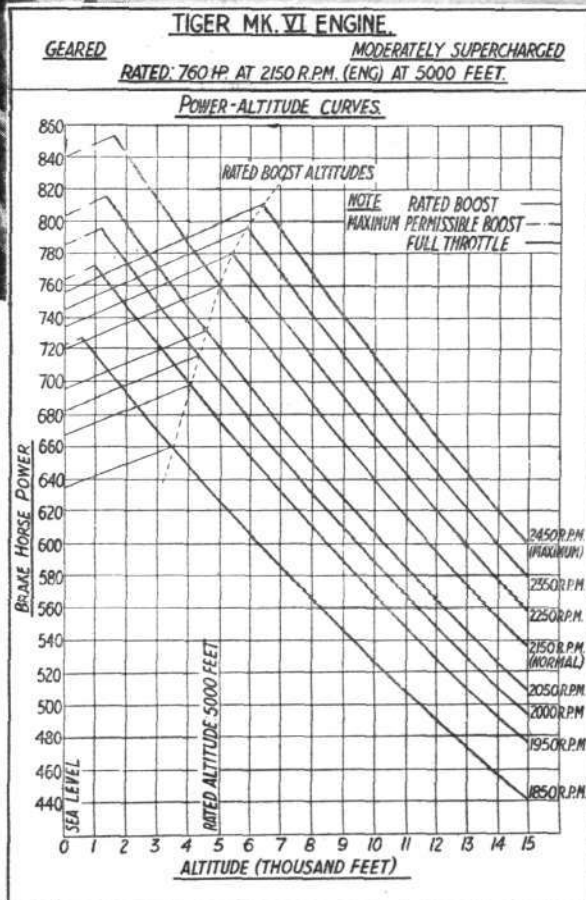
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PERFORMANCE DATA

Normal engine R.P.M.	-	-	2150
Maximum engine R.P.M.	-	-	2450
B.H.P. for take-off at Sea Level at normal R.P.M.	-	-	840/850
Rated output at normal R.P.M.	-	760 at 5000'	
B.H.P. at maximum R.P.M.	-	810 at 6400'	
Fuel Specification	-	-	D.T.D.230
Minimum octane value	-	-	87



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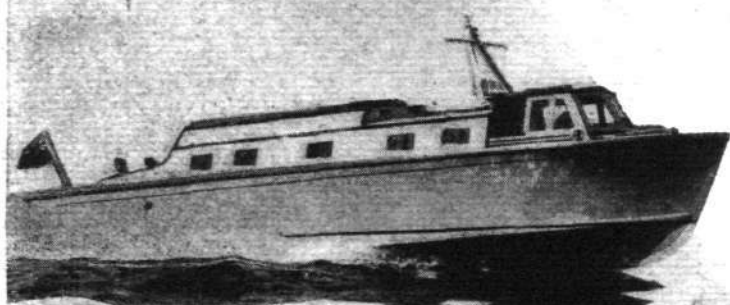
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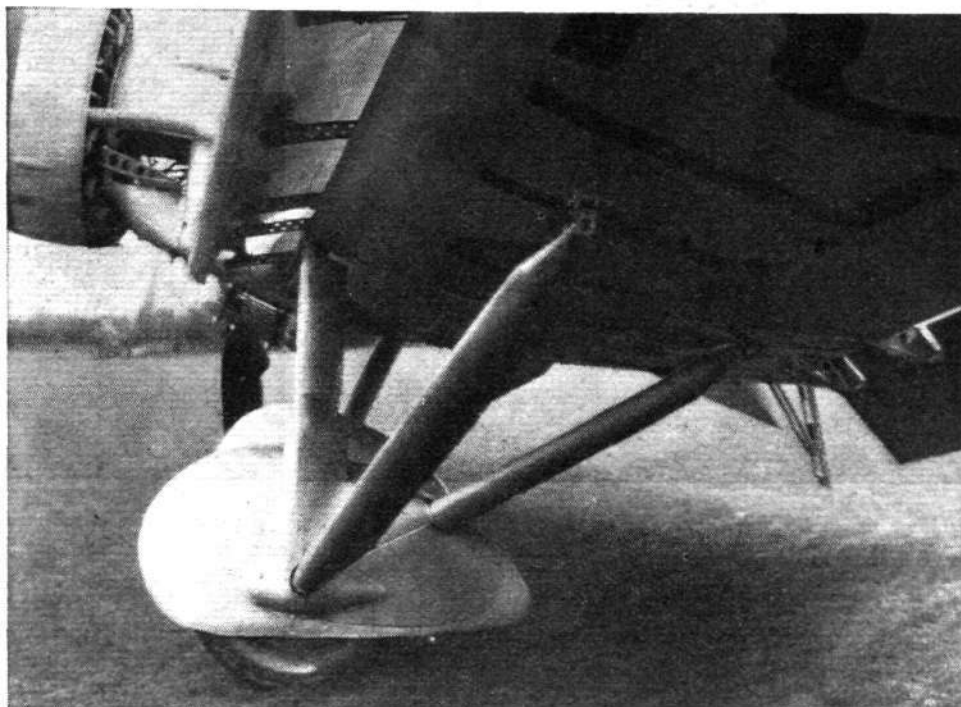
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a Military Aeroplane :
Very Wide Speed Range
Achieved : Extensive
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Slots and spats of the new G.P. Handley Page. Note the slightly curved rails on which the slots move. The leading edge slots are automatic in action. Photographs of the complete machine will be found on pages 408 and 411. (*Flight* photograph.)

OF all the different classes of aircraft used by the fighting services none places greater demands on the aircraft designer and constructor than does that known as the "General Purpose" class. Having to be applicable to a very wide range of duties, and being required to carry very extensive equipment, the type must still possess good performance, high fighting qualities such as view, field of fire, and manoeuvrability, and ability to operate from all manner of aerodromes, good, bad and indifferent. Long range is required of some of the duties for which the "G.P." machine is used, so that aerodynamic efficiency is an important consideration if the fuel consumed on a long flight is not to reduce the military load unduly.

In the H.P.47 General Purpose aeroplane the Handley Page designers have incorporated everything which modern science can suggest as an aid to aerodynamic, structural and military efficiency. The machine is a low-wing monoplane of all-metal construction, and, in spite of the heavy loads to be carried and the extensive equipment to be installed, the size is remarkably small.

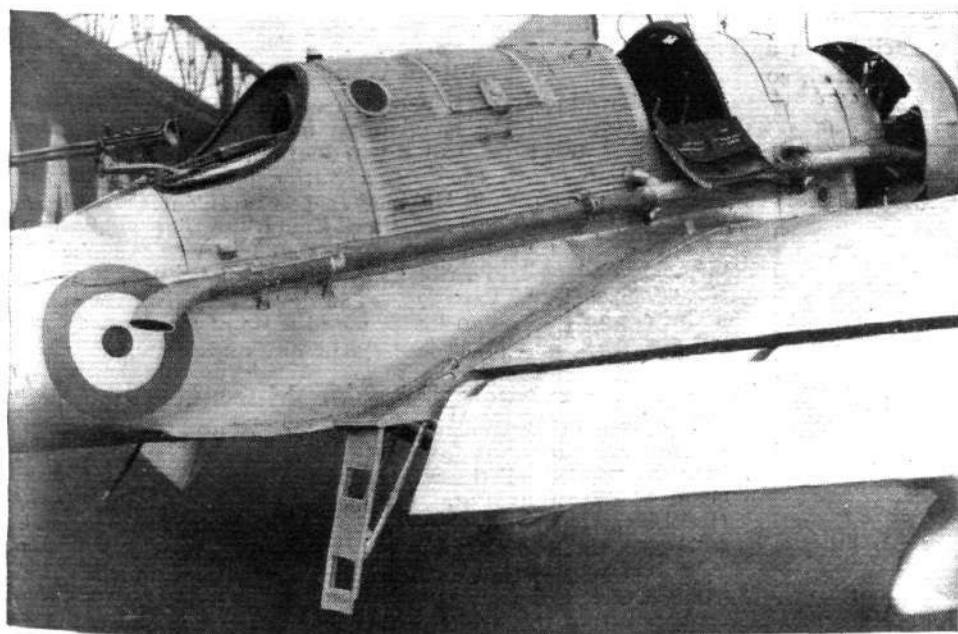
Readers of *Flight* will probably recollect that several years ago Handley Page, Ltd., designed and built a machine for a safety aircraft competition held in the United States. A wealthy American, Mr. Guggenheim, offered the prizes, and the Handley Page machine became known facetiously as the "Gugnunc." The competition rules were such as to place a premium on low rather than on high speed, and

it was the low rather than the high end of the speed scale which was encouraged, a wide speed range being, as in all aircraft performances, regarded as a measure of efficiency. In the H.P.47 no attempt has been made to obtain extremely low minimum speed. Rather can it be said that, by reducing the wing area to that which will give the highest landing speed that can be tolerated for the particular functions for which the machine has been designed, a high maximum speed has been achieved. As the machine is a military type, no performance figures may be published, but it can be said that a very high maximum speed has been combined with a very wide speed range.

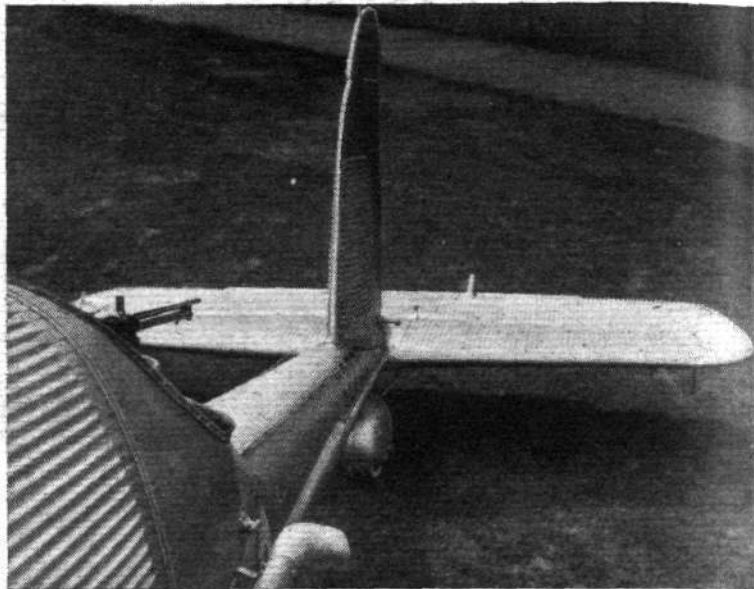
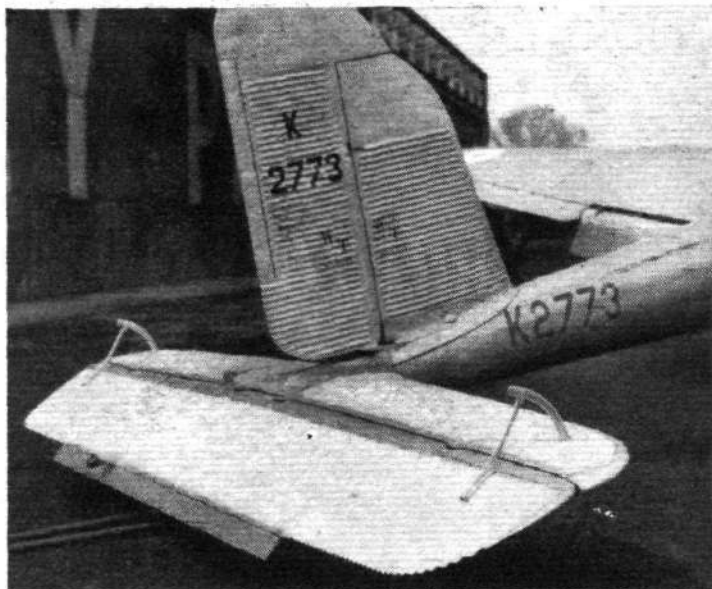
The aerodynamic features of the design which have made the wide speed range possible include the use of leading edge slots along the whole wing span, and slotted trailing edge flaps extending from the wing root fillets to the ailerons. The leading edge slots are automatic in action, opening when a certain angle of incidence is reached and closing again as soon as an angle corresponding to high speed has been attained. The slotted trailing edge flaps, on the other hand, are hydraulically operated by the pilot.

To improve the lateral control at or beyond the stall, Handley Page "Interceptors" are used. These consist in small surfaces placed just behind the automatic wing tip slots. Normally the interceptors lie flat against the upper wing surface, but when brought into action by a large movement of the aileron control the interceptor on the wing which is rising is brought into an approximately vertical position. The effect is to spoil the air flow over the wing tip, thereby reducing the lift and thus bringing the wing down.

Lateral control by the aid of interceptors has the advantage that adverse



The slotted trailing edge flap and the wing root fillet of the starboard wing. The step leading to the top of the wing folds up under the lower wing surface when not in use. (*Flight* photograph.)



The unusual tail arrangement of the H.P.47 is well shown in these photographs. As the fin and rudder are ahead of the horizontal tail surfaces they are not "blanketed" at large angles of incidence. The picture on the right gives a good idea of the view and field of fire obtained by the rear gunner. (*Flight* photographs.)

yawing moments are not set up, but in the H.P.47 yet another powerful control is provided by the peculiar arrangement of the tail surfaces. Reference to our photographs will show that instead of being placed above the tail the fin and rudder are placed ahead of the tail plane. The advantage of this arrangement is that at large angles of incidence the rudder is not "blanketed" by the tail, and thus retains its effectiveness. Another feature of the design which probably helps materially in retaining rudder effectiveness is the narrowing-in of the fuselage cross-section aft of the gunner's cockpit. This has a military as well as an aerodynamic advantage in that the rear gunner's view and field of fire in a downward and rearward direction are greatly improved.

Almost the only modern aid to aerodynamic efficiency which is not incorporated in the H.P.47 is a retractable undercarriage. With petrol tanks in the wings, and with bomb racks under the wings, it would be a somewhat difficult matter to provide space in the interior of the wing for the wheels. Instead, each wheel is carried on a tripod consisting of the telescopic leg, the radius rod and the lateral bracing strut. The latter, incidentally, runs outward from the wheel instead of inward. This is, of course, done to leave the centre of the wing unobstructed for the dropping of the bombs. Each wheel is almost totally enclosed in a fairing to reduce drag. A castoring tail wheel is fitted, so

that, with the differentially operated wheel brakes, the machine is very manœuvrable on the ground.

Of the military aspects of the H.P.47 it is possible to say but very little. The relatively small fuselage gives little indication, from an external inspection, of the extent of the equipment carried. The structure is such that the whole space inside is available, and one result is that no room is wasted and that the crew are not hampered in their movements.

The pilot, as in all single-engined military aircraft, is placed just aft of the engine. In the 47 this is a Bristol "Pegasus" enclosed in a cowling ring. The view from the front cockpit is good, and the fact that the wing is heavily tapered reduces the blind area diagonally downwards. The fuselage deck drops away at the back so that the rear gunner is well protected against draught, while at the same time he obtains a good view and a free field of fire for his machine gun.

Altogether, the H.P.47 is a very interesting aeroplane, and it will afford valuable information concerning the use of full-span slots, slotted flaps, and interceptors on a high-performance machine. The experience thus gained should be applicable to many other types.

A "Pou-du-Ciel" Journal

An interesting indication of the way in which the *Pou-du-Ciel* has captured the imagination in France is provided by the recent establishment of a new journal, "*Envol*," which is the official organ of the French National Association of Air Amateurs, of which M. Henri Mignet is president. We have received the first two issues of "*Envol*." The publication appears twice a month, and costs two francs. Anyone interested is advised to write to the Editor of "*Envol*," at 22, Rue Cognacq-Jay, Paris 7e. The journal deals extensively with items of interest to builders and users of the *Pou-du-Ciel*, but also with light plane flying generally and gliding.

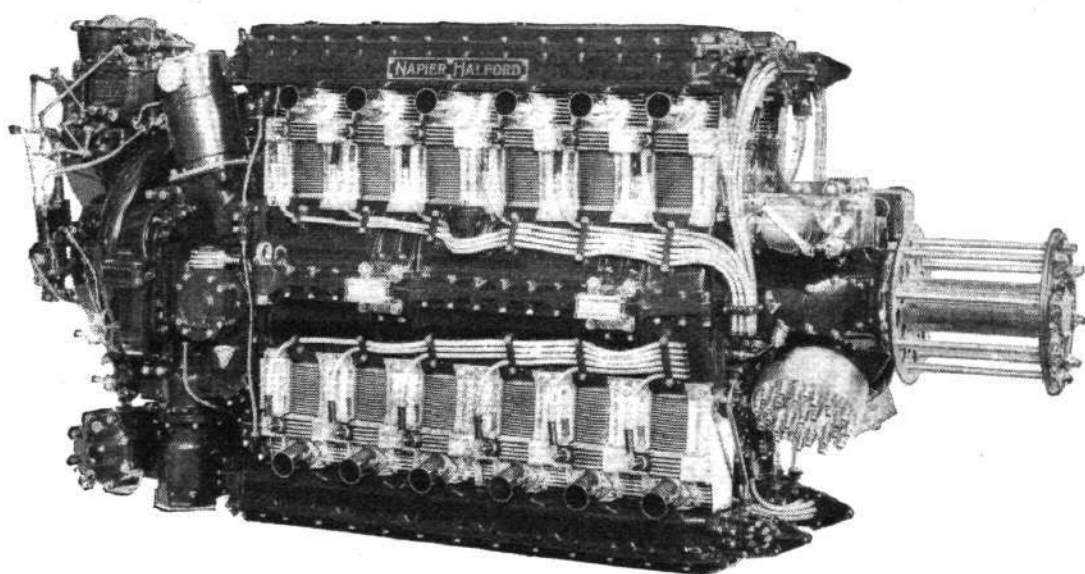
To Promote Scientific Management

The sixth International Congress for Scientific Management will be held in London from July 15-20, and an invitation has been extended to all those interested in any phase of management, whether agricultural, commercial, domestic or industrial. H.R.H. the Prince of Wales is the patron of the Congress and will open the proceedings, and the Government will invite members to a reception. Papers have been promised by eminent managers from several countries, and delegations from many parts of the world will be present. The Congress will provide opportunities for informal meetings between members and people from other countries interested in the same problems as themselves. Enquiries should be addressed to the Secretary of the Congress, Mr. H. Ward, M.Sc., S.I.C., at 21, Tothill Street, S.W.1.



Powerful lateral control is obtained by fitting "interceptors" behind the wing-tip slots. The interceptor is here shown in the "up" position. (*Flight* photograph.)

Dagger



The **NAPIER-HALFORD** **AIR-COOLED AERO ENGINE**

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HERE and THERE

Brancker Memorial Lecture

THE Council of the Institute of Transport has arranged to hold an annual open lecture on air transport. This lecture will be known as the Brancker Memorial Lecture, in memory of the late Air Vice-Marshal Sir Sefton Brancker, K.C.B., A.F.C., who lost his life in 1930 in the R.101 disaster. Sir Sefton Brancker became a member of the Institute in 1922, served on the Council from 1923 to 1926, was a Vice-President 1927-28, and President 1928-29. He contributed a number of papers on civil aviation.

The Milan Exhibition

In conjunction with the Milan Samples Fair, the First International Aeronautic Salon is to be held in the Palazzo dello Sport, Milan, from October 12 to 28. The event will be biennial, the second being held in 1937, and thus it will not clash with the Paris Salon. It is intended to divide the exhibition into ten sections, as follows: (1) Landplanes, seaplanes, helicopters, gliders, lighter-than-air craft. (2) Engines for aeroplanes and dirigibles, engine components. (3) Hydroplanes and boats. (4) Metal work, alloys, plywoods, cordage, silk, linen, cotton, rubber textiles, paints and varnishes, oils and spirits. (5) Navigational instruments, wireless plants, lighting equipment, safety apparatus, armaments. (6) Research equipment, testing apparatus, and tools. (7) Meteorological instruments, aerial cinematograph instruments. (8) Aerodrome equipment (military and civil), signalling plant, first-aid equipment, apparatus for testing physical condition of pilots. (9) Flying clothing. (10) Maps, etc.

The Palazzo dello Sport is one of the largest buildings of its kind in Europe, its floor space totalling over 30,000 sq. yds. Exhibition space will cost 45 lire (about 15s.) per square metre for aircraft of all kinds, and 100 lire (about 33s.) per square metre for accessories.

Lunch to Sir Macpherson Robertson

Sir Macpherson Robertson, K.B.E., was the guest of honour at a luncheon given last Thursday by the Royal Aero Club, which was supported by the Royal Aeronautical Society, the Air League of the British Empire, and the Society of British Aircraft Constructors. Lord Gorell, the Chairman of the Royal Aero Club, presided.

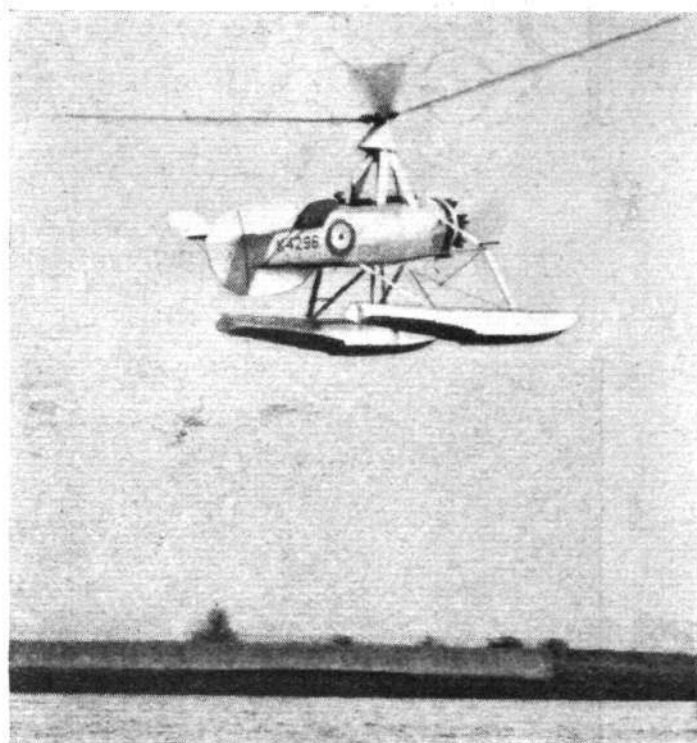
Lord Londonderry, Secretary of State for Air, proposing the health of Sir Macpherson, said that if they were to believe all the criticism they had heard—and he himself welcomed criticism—then Sir Macpherson Robertson was the man who might be said to have awoken the Air Ministry out of a somnolent condition! He felt that Sir Macpherson was to be thanked very much indeed for stimulating interest in aviation, and for the strides made since last October, which were the outcome of the race.

Sir Macpherson himself, in reply, said he did not think that when he suggested the race two years ago it would turn out to be so successful. He thought that within the next eighteen months mails would be delivered between England and Australia in between five and seven days. What, however, puzzled him was why it had been left to a confectioner to stimulate air transport!

The Duke of Atholl, President of the Royal Aero Club, presented a gold medal to Mr. C. W. A. Scott, who, with his co-pilot Mr. T. Campbell Black, has been awarded this token of recognition. A silver medal was handed to Mr. O. Cathcart Jones, and a similar medal has also been awarded to Mr. K. H. Walker, who was unfortunately abroad.



The Gold Medal of the R.Ae.C. (right), presented to Scott and Black, and the Silver Medal awarded to Jones and Walker.



"WITH BOOTS ON." Señor de la Cierva testing a C.30 Autogiro seaplane over the Medway at Rochester, where it has been fitted with floats by Short Brothers. The first Autogiro seaplane had an Avro "Avian" fuselage and was persuaded off the water off Hamble in Southampton Water. This happened many years ago, when the present system of rotor-starting had not been evolved.

Mr. S. M. Bruce, High Commissioner for Australia, in proposing the health of the Chairman, expressed his thanks to Sir Macpherson for the wonderful advertisement which he had given to Australia.

A "Landing" Altimeter

Now that wireless is being carried on the majority of commercial aircraft, the "landing" altimeter (in other words, a sensitive altimeter calibrated to function up to a comparatively low altitude) is in greater demand. When landing in conditions of bad visibility the pilot receives the barometric pressure by wireless from the aerodrome at which he intends to land, so that he can correct the altimeter according to that pressure, thereby giving himself workably accurate evidence of his height above the aerodrome and close down to its surface.

Short and Mason, Ltd., are manufacturing a "landing" altimeter with a dial reading up to 2,000 ft. or 700 metres. Accuracy to within 10 ft. is claimed. The principle of the instrument is, of course, similar to that of an ordinary altimeter, but it is fitted with a specially picked diaphragm, and is compensated for temperature over a range of minus 30 deg. C. to plus 50 deg. C. A concentric inside the height-recording one is a "pressure scale," and reads in millibars, millimetres of mercury or inches of mercury. This scale enables the altimeter to be adjusted, by means of a milled knob, for changes of barometric pressure.

The instrument, which is contained in a moulded bakelite case, is connected to the static head of an air-speed indicator; this measure is necessary because the air pressure in the cockpit of an aeroplane, particularly a fast type, differs from the barometric pressure outside the cockpit, resulting in very considerable inaccuracies of an altimeter not compensated in this manner.

"Nuts to Crack"

As many readers will have guessed, the solution to "Nuts to Crack—No. 4" in last week's issue was inadvertently confused with another problem in the series. The correct answer to the query—rough running at above 1,400 r.p.m., though carburation and ignition were in order—was as follows—

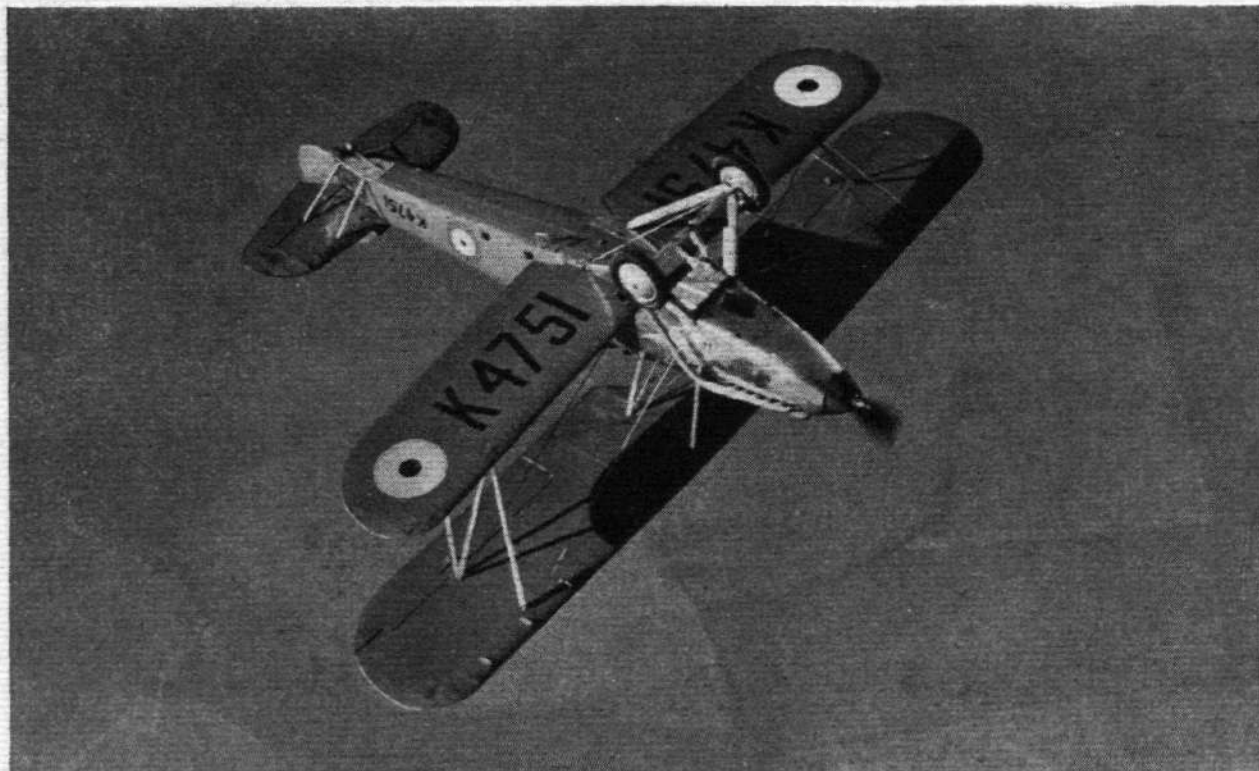
The airscrew had worked loose on its hub, and above 1,400 r.p.m. a flutter and a consequent heavy vibration set in. The spinner cap was removed, the airscrew bolts were tightened up, and the engine then ran perfectly throughout its whole range.

THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS



AIR MINISTRY ANNOUNCEMENTS



YELLOW PERIL : A Hawker "Hart Trainer" (525 h.p. "Kestrel I.B.") painted yellow, in accordance with the new regulations applying to Service trainers, disports itself over Brooklands.

THE KING AT R.A.F. REVIEW

H.M. the King will visit Mildenhall on Monday, July 1, to inspect the assembling of the squadrons which will fly past him at Duxford on July 6. Some speculation is rife as to what uniform His Majesty will wear on these occasions. He is an Admiral of the Fleet and a Field Marshal, but he has never assumed the rank of Marshal of the Royal Air Force. On the other hand, he is described as "Chief of the Royal Air Force," and it is argued that this implies a rank higher than Marshal of the Royal Air Force, and requires a separate uniform. Long ago the King was photographed in the war-time khaki uniform of the R.A.F., with "wings," but he has never yet worn the blue uniform.

R.A.F. STAFF COLLEGE

The following officers passed the R.A.F. Staff College Qualifying Examination, which was held in January, 1935. Selection of officers to attend the next Staff College course will shortly be made from these officers and from those who previously qualified and are still eligible:—

Flt. Lts. W. J. M. Akerman, D. F. W. Atcherley, G. R. Beamish, D. A. Boyle, G. P. Chamberlain, J. W. Colquhoun, L. Dalton-Morris, E. C. T. Edwards, I. J. Fitch, F. J. Fressanges, A. D. Gillmore, F. F. W. Hall, S. H. Hardy, C. M. Heard, F. S. Hodder, H. E. Nowell, M. D. Ommanney, W. A. Opie, C. B. R. Pelly, M.C., H. J. G. E. Proud, R. L. Ragg, A.F.C., P. P. S. Rickard (Stores Branch), J. E. R. Sawman (Stores Branch), G. N. J. Stanley-Turner, C. H. A. Stevens, A. H. Willetts, N. Young.

FROM COMMERCE TO DEFENCE

A business man, after long years in the City, does not usually spend his declining years as a soldier; yet such is the fortunate lot of three D.H. "Hercules" passenger aeroplanes which, after they had been supplanted by the "Atalanta" class, were sold for a low price by Imperial Airways to the South African Air Force. They are used as troop-carriers, and each machine can carry fourteen men. One of them was also used recently in a campaign to destroy locusts, the seats being taken out to make room for the sprayer.

TRANSFER OF OFFICERS TO THE RESERVE

The undermentioned short service and non-permanent officers become due for transfer to the reserve in October-November, 1935:—

General Duties Branch

F/O's. *Alexander Annan Adams, *James Aldo Bartlett Begg, John Nesbitt Dufort, Elliot Foster, William Marshall Hargreaves, Frederic Rusden Newell, Rodney Arnold Phillips, John Geoffrey Younghusband.

Dental Branch

Flt. Lts. Stanley Chayner Allen, L.D.S., Francis Frederick Kennedy, L.D.S., Charles Roland Stone, L.D.S.

Statements from the dental officers indicating whether or not they desire to be considered for an extension of service to ten years on the active list (five years for Flt. Lt. Stone) are to be forwarded.

Officers marked * have been selected provisionally for permanent commissions.

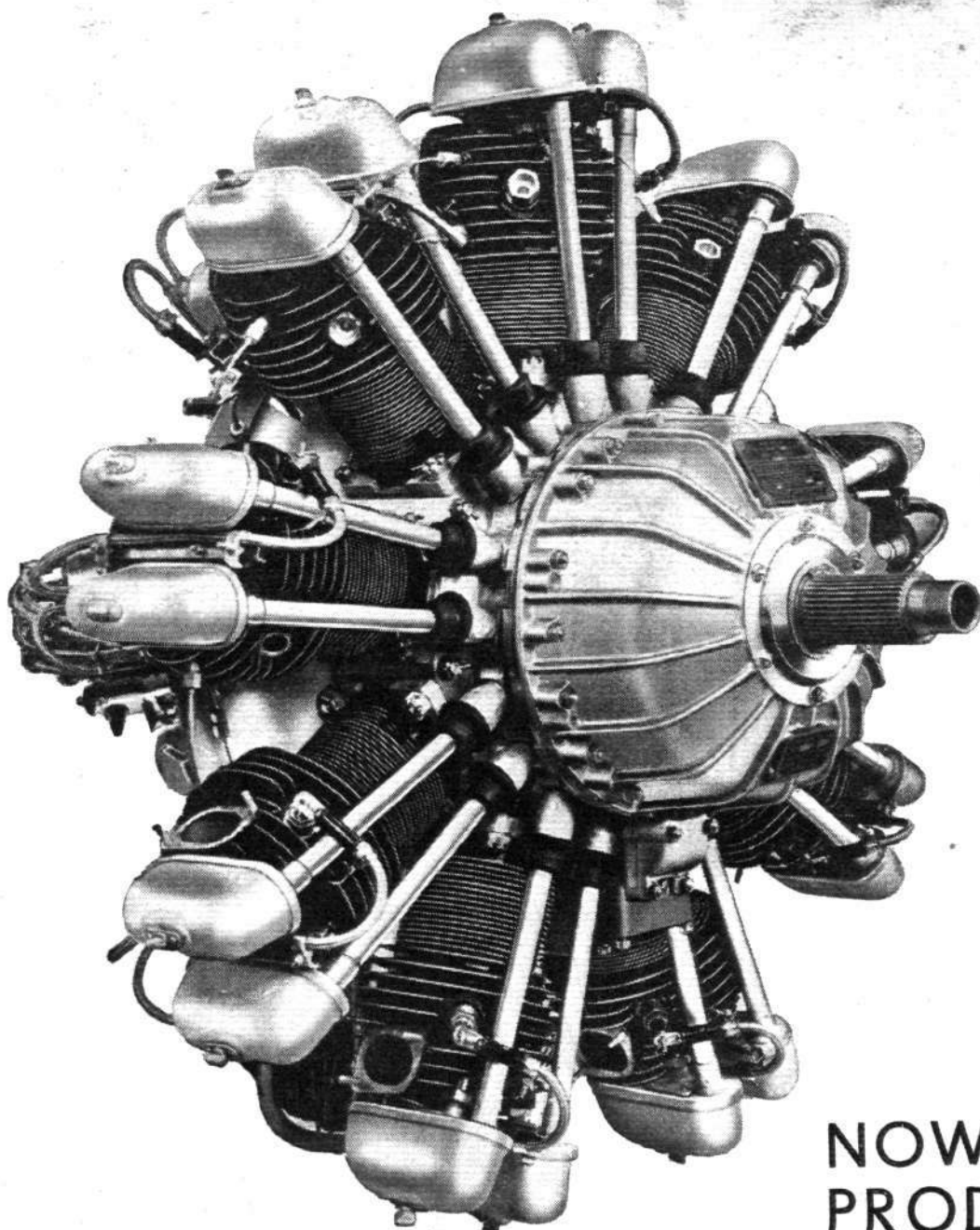
ARMY MANŒUVRES

Army manœuvres will be held for four days, Sept. 17 to 20, over Sussex, Hampshire, and Wiltshire. Four army co-operation squadrons will take part, and four squadrons will be borrowed from Air Defence of Great Britain. The latter will be Nos. 29 and 56 (Fighter) Squadrons and Nos. 18 and 57 (Bomber) Squadrons.

APPRENTICES AS ACTORS

Produced by the Halton Society, three performances of an "original comic opera" entitled "Flat Out," drew large audiences to the gymnasium at Halton Camp last week. Composed, produced and staged from start to finish within the Camp, the show was a lesson in what can be done by enthusiasm and co-operation. Epidemics had interrupted the organisation and necessitated changes in the cast, but the affair went through without a hitch. At the risk of making invidious comparisons, it must be said that, while the whole performance was good, the technical presentation—staging, lighting, and so forth—was of outstanding merit.

AIRSPPEED ENVOY FITTED WITH
TWO WOLSELEY AR9 ENGINES



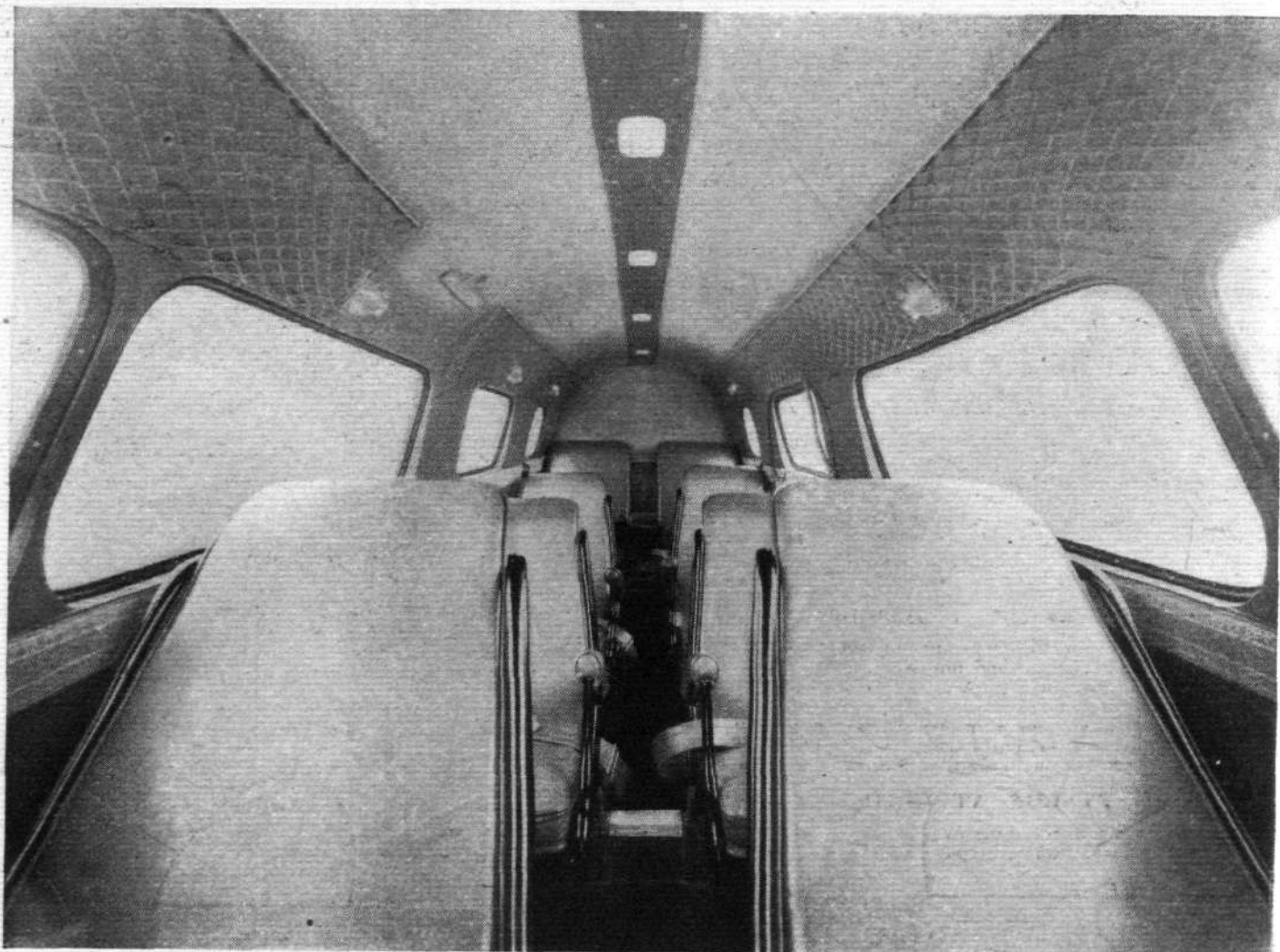
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PRODUCTION

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The Times.

"The seats were very comfortable indeed."

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AIRSPEED (1934) LTD.

THE AIRPORT

PORTSMOUTH

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EMPIRE AIR DAY

It has been decided to hold an Empire Air Day again this year on the same lines as in 1934. All home stations selected to take part will be opened to the public, at a small charge for admission, on the afternoon of Saturday, May 25, 1935.

COAST DEFENCE TRAINING UNIT

With effect from April 1, 1935, No. 1 Coast Defence Training Unit has been renamed The Coast Defence Development Unit.

NETHERAVON

The first course at No. 6 Flying Training School, Netheravon, will open on May 7. Group Capt. A. ap Ellis has been appointed to command the school. No. 13 (Army Co-operation) Squadron has been moved from Netheravon to Old Sarum, where No. 16 (A.C.) Squadron is already stationed.

AERO ENGINE OUTPUT

The Under-Secretary of State for Air was questioned in the House of Commons on April 10 as to whether the capacity for output of aero engines had been increased by associating other firms with the existing contractors. The reply was given by Major George Davies (Lord of the Treasury), who said that the capacity of existing engine contractors was supplemented as necessary by assistance from approved sub-contractors, which was considered sufficient in present conditions.

BATTLESHIPS AND BOMBS

The First Lord of the Admiralty, Sir Bolton Eyres Monsell, recently stated that American experiments had shown that bombing from the air had not made battleships obsolete. He mentioned experiments on the *Washington*, when bombs were placed outside the ship at the most effective depth and distance to test the resistance of the hull. After suffering the explosions of three bombs of the largest size and of two large torpedoes, the ship remained afloat for four days.

WIND INDICATORS

Wind indicators have been standardised for erection as required at R.A.F. stations, as follows:—(i) A standard type of mast with fabric cone at each occupied station. (ii) The mast to be erected in such a position as to be clear of all buildings. Fabric cones of white or orange colour will be made available for issue as early as possible. Cones may be painted locally with broad rings of even width to conform with any of the following combinations:—(a) black and white, (b) red and white, (c) black and orange, (d) red and orange.

SQUADRON REUNION DINNERS

Flight is asked to make the following announcement:—A dinner of No. 20 Squadron, all ranks, past and present, will be held at the Raglan Hotel, St. Martin's le Grand, on April 27. Tickets are 5s. 6d., and application should be made to P. Tame, 36, Cloudestdale Road, Balham, S.W.17. A reunion dinner of No. 60 Squadron will be held in London on April 27, and particulars can be obtained from A. Vivian, 2, Collingwood Avenue, Tolworth, Surrey.

AIR ATTACHÉ AT ROME

Group Capt. G. B. Dacre, D.S.O., the Air Ministry announces, has been appointed Air Attaché, Rome, in place of Group Capt. T. G. Hetherington.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Group Captain.—A. ap Ellis, C.B.E., to No. 6 Flying Training School, Netheravon, 1.4.35; to command.

Squadron Leaders.—C. F. Horsley, M.C., to Electrical and Wireless School, Cranwell, 1.4.35; for flying duties vice Sqn. Ldr. H. A. Smith, M.C. F. C. B. Savile, to No. 6 Flying Training School, Netheravon, 1.4.35; for Administrative duties. J. D. Breakey, D.F.C., to No. 201 (F.B.) Squadron, Calshot, 1.4.35; to command vice Sqn. Ldr. C. G. Wigglesworth, A.F.C. J. S. T. Fall, D.S.C., A.F.C., to Home Aircraft Depot, Henlow, 1.4.35; for flying (Automatic controls) duties. J. I. T. Jones, D.S.O., M.C., D.F.C., M.M., to Station Headquarters, Duxford, 1.4.35; for Signals duties. F. J. Vincent, D.F.C., to Marine Aircraft Experimental Establishment, Felixstowe, 1.4.35; for flying duties vice Sqn. Ldr. P. C. Wood. C. G. Wigglesworth, A.F.C., to D.O.I., Air Ministry, 1.4.35.

Flight Lieutenants.—D. Dickson and A. W. Hunt, to No. 6 Flying Training School, Netheravon, 1.4.35. J. G. Llewellyn, to D. of P., Air Ministry, 1.4.35.

Flying Officers.—D. J. Alvey, L. H. Anderson, C. F. Birks, G. A. Bolland, D. McC. Gordon, P. Heath, and H. W. Mermagen, to No. 6 Flying Training School, Netheravon, 1.4.35. E. J. P. Davy, to Anti-Aircraft Co-operation Flight, Biggin Hill, 1.4.35. R. C. Gaskell, to R.A.F. Station, Gosport, 27.3.35.

Acting Pilot Officers.—The following Acting Pilot Officers are posted to No. 3 Flying Training School, Grantham, on 30.3.35, for flying training:—D. K. Banks, D. M. Barrett, A. L. Boeking, S.

THE NEW SQUADRONS

In last week's issue of *Flight* were published the numbers of eleven R.A.F. squadrons which are to be re-formed during the present financial year. Four of these are to be fighter squadrons, and it is probable that they will be equipped with the Gloster "Gauntlet." No indication has been given of the comparative numbers of heavy, medium, and light bomber squadrons, but presumably No. 42 (Bomber) Squadron at Donibristle will have "Vildebeest" torpedo-planes, while No. 97 B.S. at Mildenhall will have heavy bombers, and No. 104 B.S. at Bircham Newton will have light bombers. At Manston No. 48 Squadron will receive the title "General Purpose." This is the first time that a squadron has been officially described in this way.

AIR SERVICE CLERKS

It has been decided to fill certain vacancies for air service clerks, grade III, at outstation establishments by the special promotion of air service clerks (special class) of outstanding merit. The scale of pay for air service clerks, grade III, rises by annual increments to a maximum of £249 9s. a year.

NIGHT FLYING WITHOUT NAVIGATION LIGHTS

Night flying without navigation lights will be carried out by aircraft over the Watchet Danger area, above 5,000 ft., for three hours daily from half an hour after sunset, during the period May 27 to August 31, 1935. The aircraft will not exhibit navigation lights unless other aircraft are observed in the vicinity.

HALTON ANNUAL BELGIUM TOUR

A 1935 Halton Belgium Tour for aircraft apprentices will be made from Tuesday, July 23, to Thursday, August 1, both days inclusive. This will be the tenth successive year of the scheme, and the tour this year will take the form of a reunion at which officers and airmen who have participated during former years may join the party. C.Os. may give facilities, as far as it is consistent with the requirements of the Service, for officers and airmen who wish to be included in the party to be given the necessary leave as part of their annual entitlement.

DISCHARGE BY PURCHASE

The scale of payments to be made in respect of airmen (other than those within three months of enlistment) who are permitted to purchase their discharge has been revised from April 4. The new scale requires higher sums to be paid for men in the early years of their engagement, but lower amounts in the concluding years.

For ex-aircraft apprentices, the sum required is £100 under two years, £95 after two years, £90 after three years, £85 after four years, £80 after five years, £70 after six years, £60 after seven years, £45 after eight years, £35 after nine years, £25 after ten years, and £15 after eleven years. For non-apprentice tradesmen in groups I and II, men of the medical and dental branches, and ex-apprentice clerks, the amounts range from £70 to £10; for non-apprentice tradesmen in groups III and IV, £50 to £5; and for aircrafthands and non-apprentice clerks, £40 to £5.

Dodds, P. F. Edinger, J. M. Evans, D. I. C. Eyres, G. V. Fryer, J. Fulton, G. E. Hawkins, R. H. M. Heriot-Hill, S. Hook, P. D. R. Hutchings, B. B. Jupp, N. G. Kendrick, A. de V. Leach, C. M. Lester, E. J. C. Michelmores, M. Nolan, A. B. Olney, J. E. Pelly Fry, E. F. Pippet, F. W. Richmond, J. Riley, M. H. Romer, W. R. Selkirk, R. L. Smith, E. W. Spencer, M. M. J. Stevens, F. M. Thomas, J. A. Tinne, J. D. S. Todd, J. F. Walker, R. N. Wardell, V. E. R. Williams, J. R. Wilson, R. A. Yule, and P. A. Lombard, 2.4.35.

Stores Branch

Squadron Leader.—F. N. Trinder, to Aeroplane and Armament Experimental Establishment, Martlesham Heath, 3.4.35; for Stores duties vice Sqn. Ldr. J. K. McDonald.

Flight Lieutenants.—A. Connock, to Station Headquarters, Kenley, 2.4.35. F. D. D. Gaussen, to No. 6 Flying Training School, Netheravon, 1.4.35.

Flying Officer.—L. F. Oldridge, to No. 1 Stores Depot, Kidbrooke, 2.4.35.

Accountant Branch

Flight Lieutenants.—C. L. Dook, to No. 6 Flying Training School, Netheravon, 1.4.35. A. W. Younghusband, to Station Headquarters, Northolt, 2.4.35.

Flying Officer.—R. Trippett, to No. 6 Flying Training School, Netheravon, 1.4.35.

Medical Branch

Squadron Leader.—G. H. H. Maxwell, to No. 5 Flying Training School, Sealand, 1.4.35; for duty as Medical Officer.

AIRCRAFT on the RANCH

Hunting the Wyoming Antelope Herds by Air : "Cowpiloting" as a Recognised Occupation

By VOLTA TORREY

NO legs can outrun the pronghorn antelope's. No animal has so much curiosity as the antelope. And no creature so loves the wide open spaces.

Approximately 40,000 of these American gazelles remain in the Western United States. Half of them inhabit the State of Wyoming, and a tenth of this number race about the huge Pitchfork Ranch, near Cody—a name not unfamiliar in British aviation!

For twenty years the law has protected them there. But now, as a result of substantial feed losses due to their abundance, the ranchers are allowed to hunt them again. Charles J. Belden, proprietor of the Pitchfork property, is doing so by aeroplane. Swooping over the great herds as they dash across the plains almost at mile-a-minute speed, he and his friends are bagging the antelope with guns and cameras. The photographs accompanying this article give a good idea of the spectacle that confronts the pilot of the low-flying machine. Frightened as they never have been before, the antelope flee as fast as their fleet legs can carry them.

"The legs of a band of swiftly moving antelope are



Loading a young antelope, destined for a zoo, into a Fairchild 24 cabin monoplane

one of the prettiest mechanisms imaginable," Belden will tell you. "Moving so smoothly and evenly, it almost seems as though they must be actuated by some mechanical device. They glory in their speed, too. The years of armistice between the antelopes and mankind has resulted in an eagerness on their part to compete with men as well as fellow wild creatures in their favourite sport. Whenever a motor car or man on horseback comes along a road within a few hundred yards of a herd they will begin to run on a parallel course.



A fine impression of fleet-footed pronghorn buck—known in America as antelope—fleeing in the shadow of the photographer's plane.

"Furthermore, as if to clinch their claim to the speed title they will usually begin to edge in towards the road and attempt to cross in front of the horse or vehicle. They like nothing better than to run in circles around some swiftly moving object.

"I know of several instances in which antelopes have been knocked down in their insane attempts to pass in front of automobiles on the highways.

"The fact that the antelopes usually travel in herds makes them a particularly charming prey for the aeroplane hunter. In the early days the herds often numbered several thousand, and groups of 300 and 400 may often be seen now. During the summer they scatter somewhat, but with the approach of winter they draw together again. A doe usually leads the herd, even though there may be several bucks in it. The males, however, constitute a rearguard, and often one big buck will remain at a considerable distance behind the band as a sort of look-out man."

A Sideline

Recently, Belden has developed a profitable sideline, thanks to the antelopes on his ranch. He catches them, as babies, and supplies them to zoos in various parts of America; they sell for \$200 a head (approximately £40, as this is written).

Here, too, an aeroplane has come in handy. Three of the baby antelope were recently shipped across the Rockies in an ordinary cabin plane to a Californian purchaser. The speed and smoothness of air travel makes it the ideal way to transport the delicate animals. Actually, however, the antelope does not take kindly to captivity. The herds in the United States national parks do not thrive as well as do those on the open range. For, as Mr. Belden points out, the creature's delicate, highly strung sensibilities seem to demand the great open stretches where it can run unhampered for miles on end. Nor can the antelope ever change his habits. He will always keep to the plains or the high, rocky plateaux that can never be usurped by the agriculturist.



(Above) Stampede—another remarkable low-flying photograph. Note the collision between two of the animals.

(Below) Two baby antelopes on arrival at Los Angeles from Wyoming, a distance of 1,500 miles.



Although racing, photographing and shooting these creatures is perhaps the most pleasant use for an aeroplane on a Wyoming ranch, it is far from the only one. Many ranchers besides Belden use planes.

With wings a cattle owner can keep an eye on his far-flung possessions far better than he can on horseback. And distances are so great in the ranch country that, when an emergency occurs, a single flight may be worth all that an aeroplane costs. Tom Arnold, operator of the 100,000-acre XU Ranch in North-Western Nebraska and South Dakota, will testify to this statement. When his daughter fell from a horse and fractured her skull she was put in the ranch plane and rushed to Omaha, 450 miles away, where the fracture was treated successfully.

Other ranchers employ trained pilots as cowhands. For the latter the term "cowboy" is fast becoming "cow-pilot." And it is not risking too much to prophesy that the day is not far off when there will be such a young adventurer in the bunkhouse of almost every great American ranch.

COMMERCIAL AIRCRAFT

Capt. G. de Havilland's Lecture (Abridged), Read Before the Royal Aeronautical Society last Monday

AN aeroplane at first appears to be uneconomical. It may have over 100 h.p. per passenger, giving an expensive impression, but aeroplanes can achieve over sixty passenger miles per gallon of petrol at higher speed than any other form of transport. This figure is a good criterion by which to measure other running costs. Types embodying simplicity, low power, light loading, and low cost have achieved the objects for which they were produced, and have played a very great part in spreading aviation over the world.

There is a general, though in this country tardy, recognition of the vast possibilities of civil flying which may result in the provision of well-equipped routes and the other facilities without which high-speed transport cannot come into being. This will have an important effect in freeing design from the limitations caused by undeveloped conditions of the route, it will alter the economic basis of air transport, and justify the use of the really high-speed machine.

Increasing Design Speed

The familiar law that speed increases as the cube root of power, so that doubling the power only gives a 26 per cent. increase in speed, does not directly govern the design problem, for the first essential in comparing designs is to stipulate that each one considered must be loaded up to the same take-off facility, or some similar criterion such as the ability to fly with one engine out. For the present purpose the take-off over the screen will be used.

The general effect of increasing power to get speed may be seen by considering some particular aeroplane to be redesigned for an increase of power, but with the main dimensions unaltered. With the greater power the total weight for take-off can be increased, although the new w./h.p. cannot be quite so great as the old because the loading has increased. Of the increase in weight, some must be set aside for engine and fuel, some for increased structural strength, and the balance is available for pay load.

We have on one side of the account a bigger pay load and a higher speed, while on the other is a larger h.p. and therefore a greater fuel and maintenance cost. The fact that the speed has only increased as the cube root of the h.p. is offset by the greater load carried.

Wing Loadings

Naturally these clear-cut cases do not occur in practice. It would, for instance, in the above example be necessary to lose a little speed by increasing the size of the fuselage to accommodate the bigger load. When all these things are taken into account, however, it will be found that increasing the speed does not involve higher running costs expressed as ton-miles per gallon, at any rate within the limits imposed by practical considerations. The wing loading will, however, progressively increase as the design speed is increased if the ability to take-off is the same. There does not seem to be any difficulty yet in getting into aerodromes with the devices now available. Wing loadings of well over 20lb. per sq. ft. with heavy span loadings are quite common, and the landing qualities of such machines are well spoken of.

The underlying features involved are then as follows:—

(1) The combinations of power and surface loading which will ensure a given take-off facility.

(2) The speed which can be expected from the combination selected having regard to size in relation to power for a given degree of cleanness.

(3) The percentage of the total weight which will consist of aircraft structure, as determined by the size of the aeroplane and its loading.

Estimation of these factors is necessary to determine the nature of the variation of load carried with the speed of flight if take-off remains the same. If examples are so worked out they will show that the pay load decreases roughly *pro rata* with the increase of design speed, thus leaving the commercial performance unaffected (this being measured by the product of speed and pay load or ton-miles) and making high speed an

additional asset for which no payment in ton-mileage is incurred. This result will be approximately arrived at whatever method is employed in estimating the quantities involved. My basic assumption has been that all aeroplanes considered must be so designed that they take-off equally well, and those who have expressed opinions on the cost of speed would have arrived broadly at the same conclusion if they had used the same basic assumption. It follows that the wing loading will increase as the design speed is increased, and will eventually limit the speed. If speed and load carried can be exchanged over a wide range without altering the ton-miles per gallon, it would be interesting to see how this would work out in practice. Assuming moderate or slow speed, would it pay to take half the load at twice the speed? Operators can say to what extent terminal delays affect the problem. It depends on the air route considered, but speed is of such high value that the disadvantages have to be very real to warrant the use of the slower type.

That structure percentage increases with size and diminishes with loading has been doubted. The existing sliding scale of load factors which is arbitrary and not necessarily permanent masks it to some extent. While the bulk of the weight is carried in the middle of the aeroplane it is inevitable, and can be demonstrated by examples which exhibit the relation of structural percentage to the total factored weight (*i.e.*, the "failing" weight) and its variation with size. The increase of structure percentage with size has the effect of limiting the combinations of power and surface loading to the fast end of the scale in the case of large aeroplanes if a good transport efficiency is to be reached, as is very evident to-day.

Practical Examples

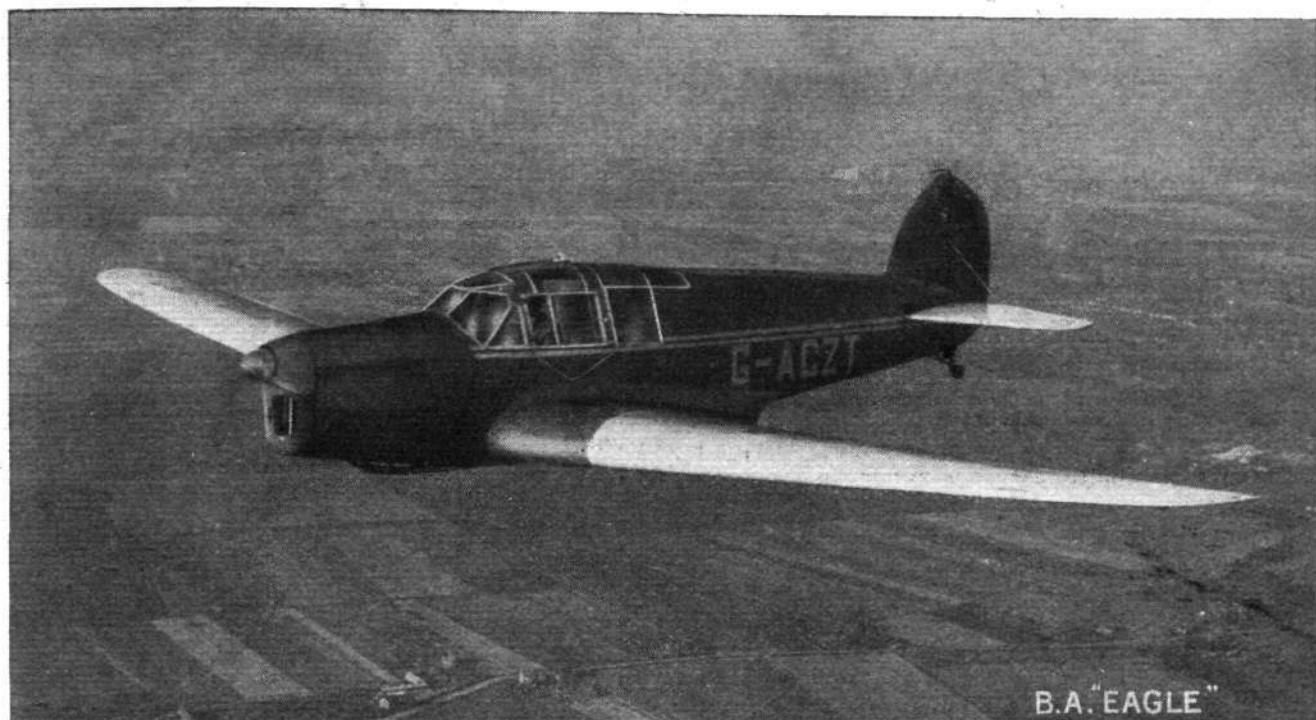
An examination of transport aeroplanes in extensive use to-day will show that from 40 to 60 passenger miles per gallon are achieved, and that there is no discernible departure from this for under 100 m.p.h. to over 200 m.p.h. cruising speed, provided the load carried is referred to the same take-off facility over a screen. If the criterion used is a less artificial one of, say, ability to fly with one of two engines out, or rate of climb, or reserve power near the ground, then the faster machines will be found to have a greater passenger mile per gallon performance than the slow. There are obvious difficulties in comparing many types, and unless they are all designed to the same take-off, some adjustment is needed. It will be found, however, that no advantage in running costs is disclosed by low speeds and large paying loads. The faster machine must have a greater initial cost per seat, as always where more power per passenger is installed. The extent to which this matters will be determined by the mileage per annum achieved, and this in its turn by the ground organisation for day and night flying, the traffic density, and so on. Simple arithmetic will show that the initial cost per seat can be allowed to increase in direct proportion to the speed (for a given number of hours flying per annum) without advancing the obsolescence charges or any others which depend on the first cost of the machine.

British commercial flying has been either slowly working up traffic unassisted or pioneering once-a-week services over desolate regions without mail contracts, and the only possibility has been to use the slower types which are of low first cost per seat. It is equally evident why development in America has been towards the high-speed highly loaded type which, under American conditions, can rapidly reduce obsolescence or depreciation charges to proper proportions.

The important point is that there is little difference in running costs.

A given load can often be more efficiently carried in two machines of moderate size than in one big one owing to structure weight. This question is complicated by the amount of fixed equipment carried, and which is variable on different services. Where a restaurant and a considerable crew is carried the passenger capacity cannot be too small, though it will pay to go for high speed and moderate pay load more and more as the size of the unit increases.

The process of reducing size and increasing speed can be carried further in single- than in multi-engine machines, because in the latter there is a fixed amount of engine nacelle, fuselage,



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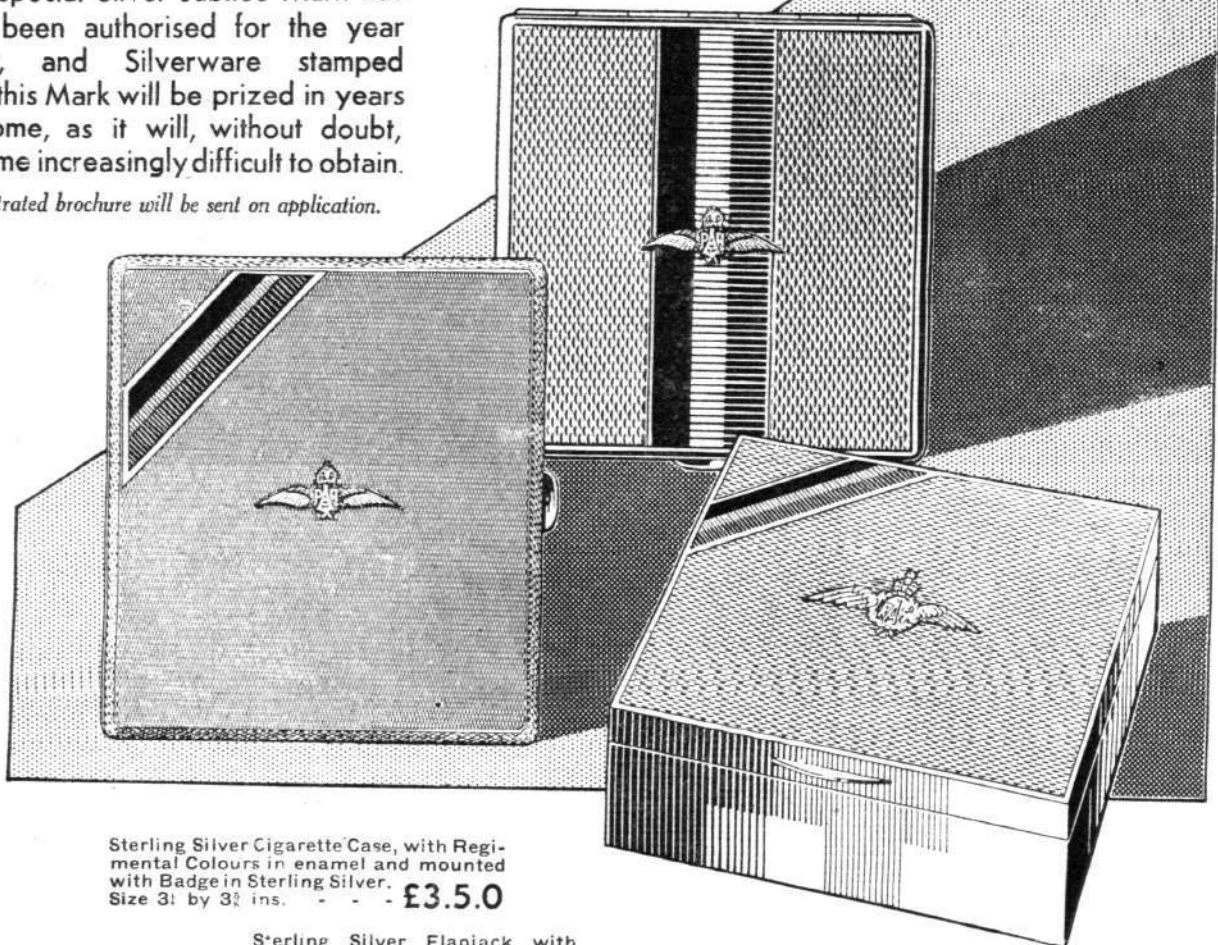


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A special Silver Jubilee Mark has been authorised for the year 1935, and Silverware stamped with this Mark will be prized in years to come, as it will, without doubt, become increasingly difficult to obtain.

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etc., which is of considerable resistance, and it would not produce a proportionate increase of speed to leave this alone while reducing too much those parts of the aeroplane concerned in lifting the load. It has, however, been found in practice that heavy loadings and high speeds are practicable up to a considerable degree for twin-engine machines.

The gradual working up of traffic without a basis of fixed contract loads or other Government assistance is a slow process which has developed further in this country than elsewhere. High-speed transport must take a long time to develop under such conditions, and operators cannot be expected to embark on the larger capital cost necessary to get high speed without being able to foresee the traffic which would follow.

Variable-pitch Propellers

Variable-pitch propellers have an overwhelming influence on the possibility of making fast, economical aeroplanes. The propellers of slow machines are working under tolerably good conditions during take-off. The blades are not stalled and the r.p.m. are not unduly low. As the design speed increases the blade angles have to be made relatively coarser to deal with the cruising speed, and this leads to stalled blades and low r.p.m. during take-off. Variable pitch enables these angles to be reduced so that full r.p.m. and efficient blade angles may be used during take-off. Were it not for this, 50 per cent. of paying load might have to be omitted in high-speed machines to secure the necessary take-off, apart altogether from the difficulty of getting engines to stand up to low r.p.m. and full throttle.

Supercharging

It is necessary and legitimate to take more power from an engine during the short period of take-off than for cruising. If the cruising power were 70 per cent. of the take-off power, full throttle could be used at 10,000 ft. for cruising and reduced throttle below that height, but up to 10,000 ft., in this case, there would be no use for a supercharger unless it was necessary to take-off from high altitude aerodromes.

By suitably arranging the compression ratio, etc., engines can be "ground boosted" up to greater powers than the same engine without a blower. This is equivalent to installing a more powerful engine, but a lighter way of doing it. A supercharger which did not enable maximum power to be developed for take-off would be of limited use commercially.

"Comet" as an Illustration

The "Comet's" engines are of a relatively heavy commercial type. When fitted with V.P. propellers, air pumps for instruments, etc., they weigh 2.3 lb. per h.p. The other things tending towards weight are the flaps, retractable undercarriage, and the fact that the wing is a full cantilever of small thickness. These are, however, overbalanced by its small dimensions and high loading, both of which permit of a low structure weight (26½ per cent.) which, together with its speed, give it the extremely high value of 9.6 ton-miles per gallon for 500 miles range, at its operating height of 10,000 ft.

If the machine was scaled up to four times the power—still quite moderate—the fuselage would become a commodious

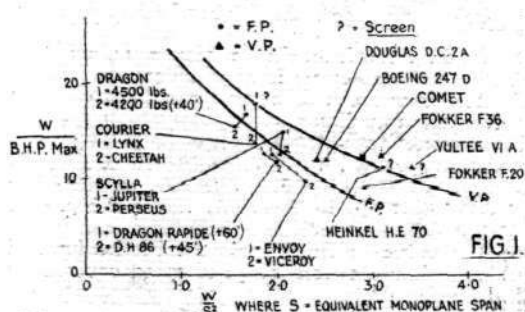


FIG. 1.

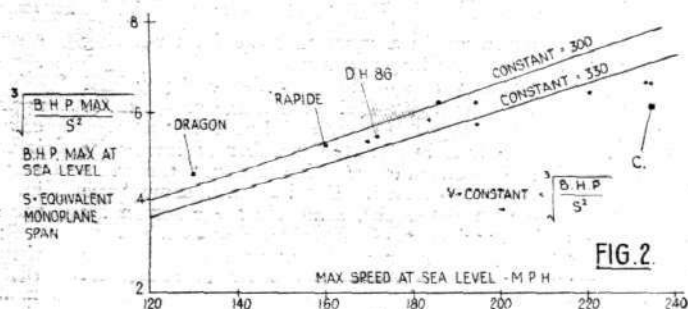


FIG. 2.

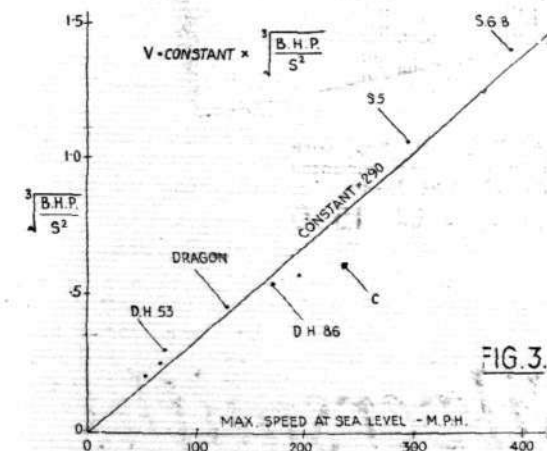


FIG. 3.

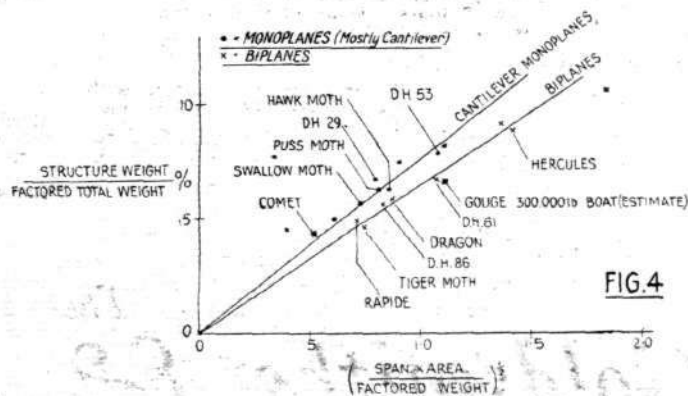


FIG. 4.

Notes on the Above Diagrams

FIG. 1.—The curve marked F.P. shows a relation between span and power loadings which determines the weight at which an aeroplane fitted with fixed pitch airscrews will comply with the British and I.C.A.N. normal take-off requirements (66 ft. height attained after 656 yards from rest). The curve marked V.P. shows the same thing when fitted with variable pitch airscrew.

Aeroplanes whose plotted points lie above the appropriate reference line would experience more difficulty in complying than those below, conversely, those below might be expected to clear the screen by some margin; in such cases the excess height above the screen, where known, is indicated in brackets after the name of the aircraft.

The curves are purely general, and only take account of the most important factors influencing take-off and climb. For instance, aerodynamic cleanness would have some influence on the position of the reference lines.

In general aeroplanes whose plotted points lie toward the right-hand side of the figure would be fast; and those to the

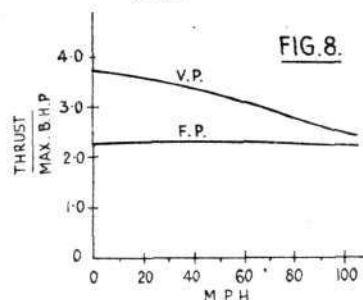
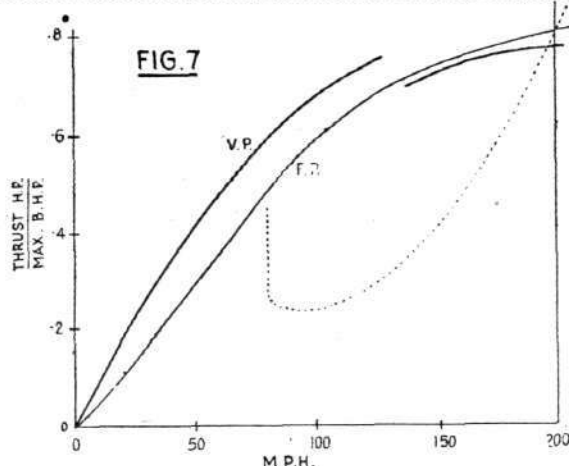
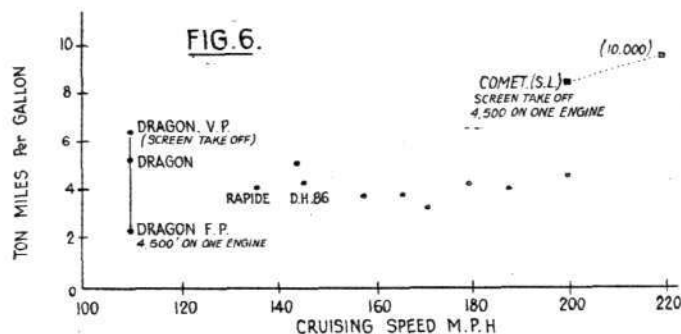
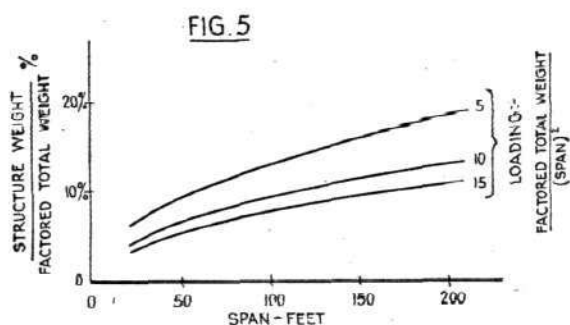
left, slow. The effect of high top speed on airscrew characteristics at take-off speed in their relation to take-off has been included in the curves.

FIG. 2.—Speed depends closely on frontal area per h.p. for a given degree of cleanness. Span is here used as a measure of frontal area. This is particularly convenient because span also determines fairly closely the $w./h.p.$ which can be lifted over the screen. This figure is thus linked with Fig. 1 through span and h.p.

FIG. 3.—Same as Fig. 2, but illustrates the applicability of span and h.p. as a measure of speed over a wide range of speed, and for widely differing types of aeroplanes.

FIG. 4.—Variation of structure weight with size and loading. The curves are strictly speaking empirical, being based on a large fund of well attested data for widely different types of aircraft. They are also in close agreement with theoretical laws for various types of structural members.

Figs. 1, 2 and 4 embrace the three most fundamental and interdependent factors in the problem under discussion.



Notes on the Above Diagrams

FIG. 5.—Fig. 4 expressed in a more tangible form showing separately the effects of loading and size.

FIG. 6 contains actual values of the ton mileage of pay load per gallon of fuel when carrying fuel for a range of 550 miles for a number of current types of commercial aeroplanes.

It should be borne in mind that a number of important factors influencing the ton-mileage/gallon are not the same for all the aeroplanes represented. For instance, some have V.P. airscrews and some have not, some clear the screen by a large margin and some do not.

FIG. 7 shows the thrust h.p. available at various speeds for either a Fixed Pitch or a Two-position Variable Pitch air-

screw installed in an aircraft having a maximum speed of 200 m.p.h. A h.p. required curve is also indicated.

The V.P. airscrew is assumed to be designed for a speed of approximately two-thirds maximum, this being about the best compromise between the take-off and speed conditions; there is a loss of maximum speed with the V.P. airscrew of approximately 3 m.p.h. compared to the F.P. airscrew, on the other hand, it is possible to lift 1½-2 lb. more pay load per h.p. over the screen with the V.P. airscrew.

FIG. 8 shows the curves of Fig. 7 plotted in the form of thrust (lb.) per max. b.h.p. over a range of speed covered by the take-off and climb.

cabin without any alteration of proportions. Some loss in structure weight would be incurred, but there is something in hand in engine weight, and no doubt an outstanding high-speed aeroplane could be developed on these lines.

Take-off and Landing Regulations

The present take-off regulations have served a useful purpose, but the high-speed, highly loaded aeroplane has, for the same screen performance, a much higher ceiling and therefore reserve power. If long overseas journeys are wanted at high speed in the future it would be easy to licence aeroplanes for the use at some greater weight for one particular aerodrome with sufficiently long runways and make the safety requirement a minimum ceiling or rate of climb. Such a course would be more economic than limiting the load or the range to comply with a requirement which would merely adversely affect the utility of the aeroplane in the particular circumstances. The regulation for landing run may soon be restrictive also for high-speed aircraft.

Passenger Accommodation

Passenger comfort is chiefly dependent on the type of seating, cubic capacity of cabin, noise and ventilation. Having travelled to East Africa and back last month by Imperial Airways, it was interesting to get the passenger's impression over a long route which varies in climate and scenery. The high degree of comfort of the Short "Kent" and Handley-Page "Hannibal" is well known, and I would only mention features which impressed one as being of greatest importance from the passenger's point of view.

Design of chairs and cushions must be carefully thought out. The clear large window of correct height does much to relieve the tedium of a long journey, because air travel gives the passenger an extensive view of a slowly moving and ever-changing landscape, which no other method of travel does.

It is doubtful whether much can be done to eliminate noise by modifying the engine or exhaust system. Geared-down propellers are, however, a great advantage from this point of view, and their relatively quiet running is sufficient to warrant

their general use. A position of engine and propeller where they are screened from the cabin by the plane structure is the most effective way of reducing noise. This is borne out in the case of the "Kent" and the "Hannibal" types, both of which have reasonably quiet cabins.

Ventilation is usually good on modern air liners, and is not a difficult problem. The separate ventilator for each passenger, which is now in general use, seems to give the best results.

Constructional Materials

There is a tendency to look upon metal as a more suitable material than wood, and any improvements in the strength/weight ratio of materials are to be looked for in metal. On the other hand, years of actual service under extreme climatic conditions have proved that wooden construction gives little trouble, cannot suffer from the effects of fatigue, and is cheaper to produce and repair.

The "Comet" wing is an example of a new form of wooden construction, where spruce planking is used to form a thick stressed skin which gives a very robust and durable structure and eliminates fragile sections which are liable to damage.

For machines of moderate and small size wood has been adopted primarily for reasons of cost and speed of production and has proved safe, light, and reliable. The use of metal is not yet warranted owing to what is known as mass production. Few will doubt, however, that metal, or possibly synthetic material, will eventually be used universally, because it is in this direction we must look for lighter construction.

Monoplanes and Biplanes

Biplane construction is lighter and the monoplane faster, but any such generalisation wants defining. It is easier to take-off with a large load on the biplane, because light loading is more easily obtainable. This makes the biplane suited to operations from poor aerodromes and high altitudes where light wing-loading is called for. It cannot be said, however, that one is "better" than the other. The modern high-speed

Concluded on page 428.



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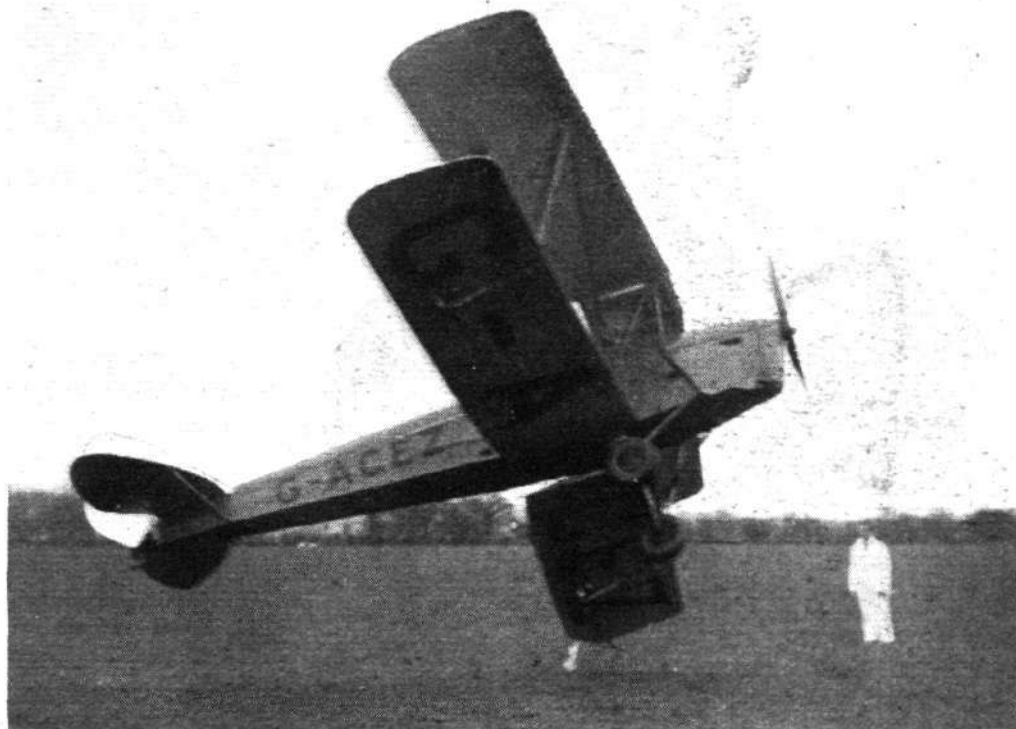
WITH a public that has, for the most part, become inured to the sight of mere flying, or even of aerobatic flying, a modern team of display pilots must be beyond criticism, and a modern display must rival, if in miniature, the great show at Hendon. Furthermore, Sir Alan Cobham's display, designed as it is to encourage people to use the air, must blend the spectacular with the commonplace so that the "circus" element is not too dominant.

Actually it is possible, with a well-knit collection of experts, for such a show as the National Aviation Display to improve, in some respects, on the big affair of the year. Since the crowd is not so large and the area not so congested, the trick pilots can perform all their evolutions at a height which allows the always Roman-holiday spectators to see the expression on the performers' faces! In addition, crazy flying, by far the most entertaining type from the spectator's point of view, can be seen, and the public has an opportunity of being with the machines as passengers in all but one or two of the events.

A Borrowed Autogiro

At Redhill on Saturday Sir Alan's show was incomplete, the Autogiro being without its necessary rotor blades, and the organisers were lucky in having the use of the Redhill Flying Club's Autogiro and of the club's instructor, Mr. R. F. Bulstrode, who was kept busy during the whole afternoon either demonstrating or giving short flights. In fact, the interest of the general public in the machine, which the efficient announcer alluded to as the "wingless wonder," was most marked.

For this year's series the fleet is larger and several new items have been introduced, not all of which were taken out of the hat at Redhill. However, Mr. C. W. A. Scott gave a short address. Mr. H. L. Brook demonstrated his record-breaking Miles "Falcon" and spoke the odd word, and Miss



One way of picking up a message. Flt. Lt. Tyson uses his port wing-tip for his well-known handkerchief trick. (Flight photograph.)

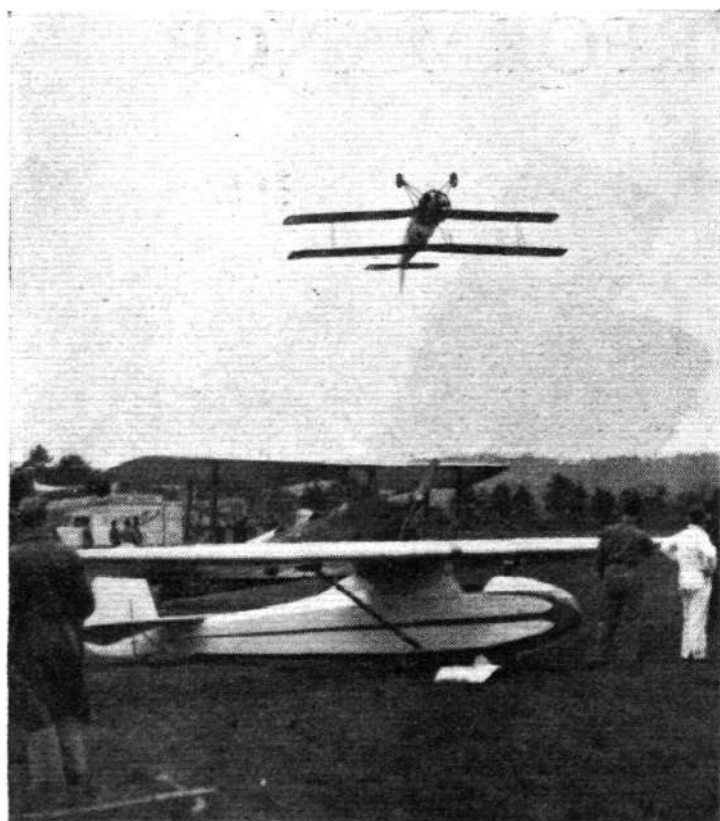
Heron-Maxwell was pulled off, the Handley Page "Clive," Astra, simultaneously with that accomplished "brolly" expert, Mr. Ivor Price. Both landed firmly and unharmed more or less in the centre of the aerodrome. Flt. Lt. Tyson now uses an Avro "Tutor" ("Lynx") for his singularly clean display of inverted and other aerobatics. Never were slow rolls so slow and rocket loops so interminably prolonged. With the extra power, enabling him to climb quite steeply in the inverted position, the recovery from a disturbingly low final inverted passage over the crowd is rather less disturbing. Flt. Lt. Tyson looks safe enough, though engines do stop occasionally, even in the year 1935.

Refuelling

The "Clive," of course, carries a maximum complement of passengers with a comparatively small supply of fuel and, from the operational point of view, the work of the special mobile National Benzole tanker is most interesting. The whole job is carried out in a few moments—and moments are valuable in such an accurately organised display. Incidentally, organisation also extends to the careful planning of innumerable circuits and landings when minor ground accidents must be avoided. One or two pilots who were roped in for this first display could be excused for "rubbernecking" their



Miss Meakin wheels her special glider into position for the tow-off. Sir Alan himself brings up the end of the cable. (Flight photograph)



Flt. Lt. Tyson's aerobatic finale—an inverted passage over the watching crowd at a height which allows the spectator to study the pilot's facial expression in comfort.
(Flight photograph.)



Three Australian record holders : From left to right, Mr. H. L. Brook, Sir Alan Cobham and Mr. C. W. A. Scott.
(Flight photograph.)

way about the ground and sky, but with more than half-a-dozen machines in the air at once over an area covering a few acres there was not a single tense moment. Flt. Lt. Johnson and the rest know all there is to be known about massed passenger flying.

After the continued roar and crackle of half a dozen variously sized machines, the silent and austere performance of Miss Meakin in her special aerobatic Wolf glider was distinctly restful, and the very quietness of the performance provided the best possible advertisement for soaring as such. After being towed up to a couple of thousand feet she made a few strikingly abrupt little loops—her gliding speed, one imagined, was about 30-35 m.p.h.—and manoeuvred for her landing.

There is no doubt that Sir Alan Cobham is giving better value than ever during this season.

COMMERCIAL AIRCRAFT

(Continued from p. 426)

aeroplane has become, quite generally, a low-wing cantilever monoplane. The relatively small dimensions associated with high speed permit this construction without feeling its structure weight too seriously, and it lends itself well to retractable undercarriages. This type has been developed very much in America, where the conditions call for machines of moderate size and high speed.

Large Aeroplanes

The great problem is the increasing structure percentage with size. Hitherto this has been countered partly by the lower load factors required, and partly by increased wing loading, especially for seaplanes. An end must, however, come some time to increases of loading, and then the problem of distributing the load span-wise will arise, as this would be an effective way of keeping structure weight down. A drastic departure from orthodox designs would be necessary in carrying this process very far, but it has already been done to some extent—as in the Do.X. Although superficially some big aircraft do not seem to have run into this weight increase very badly, it will be found that they all conform pretty well to the effects of size and loading when proper allowance is made for load factors

Evolution of Commercial Types

If we take a rapid glance at the evolution of commercial flying in the last ten or twelve years, we see that from the beginning of the period there has been a definite and sharp breakaway from military evolution. The two lines of development might be described as getting the utmost return in performance for every horse-power developed on the one hand, and getting the utmost performance regardless of the power used on the other, or military side. Rapid steps were made in small aeroplanes until their transport performance was about the same as a motor car—say, twenty miles to the gallon with three people up—but at a far greater speed. In a few years small aeroplanes have surpassed the speed of their single-seater fighter ancestry with about one-quarter of the power. They have done important work in making flying possible all over the world, and have set a standard of economy for large commercial aircraft.

This evolution has taken place in a steady and healthy

manner, and is responsible for the fact that there is more purely commercial and unsubsidised flying in this country than anywhere else. This progress by means of small and continuous steps, without too great a commercial risk, would have been the best and surest way of leading to high speed transport.

If everyone had done the same thing the position in this country would have been excellent, but when other countries are spending large sums on ground organisation, mail contracts, etc., they are obviously able to make very rapid progress.

Everyone must admire the almost spectacular technical progress made in America. This progress in design and research has been intimately connected with intensive experience on the air lines. Progress in commercial flying can take place in no other way. Isolated prototypes or technical achievements which are not directly linked with continuous hard use can play only a small part in furthering air transport. When ground organisation is thoroughly developed and there is a solid foundation of mail or other contracts on which to base services, all the rest will follow. These are the conditions under which rapid progress in design and research will take place and for which there is no substitute. Unassisted British operators are putting up a good fight to find traffic under adverse circumstances among which must be numbered a crushing tax on fuel if operating internally, and often very high fuel costs due to transport charges if operating overseas. There is every hope, however, that the growing recognition of the value and importance of air transport will assure this country the opportunity of keeping in the forefront of technical progress.

Simplified Flying in Russia

A two-seater machine, fitted with an automobile motor from the Gorki plant, has been constructed by the Soviet gliding expert A. I. Pleskov in conjunction with Sevastyanov, technician of the Saratov Aero Club, and the gliding pilots Kovalenko and Mazalov. Only a few changes were made in the motor to reduce its weight, and the machine, which is estimated to cruise at about 70 m.p.h., was recently tested. The value of the machine lies in the fact that it will be cheap, and will be able to work on cheap petrol.

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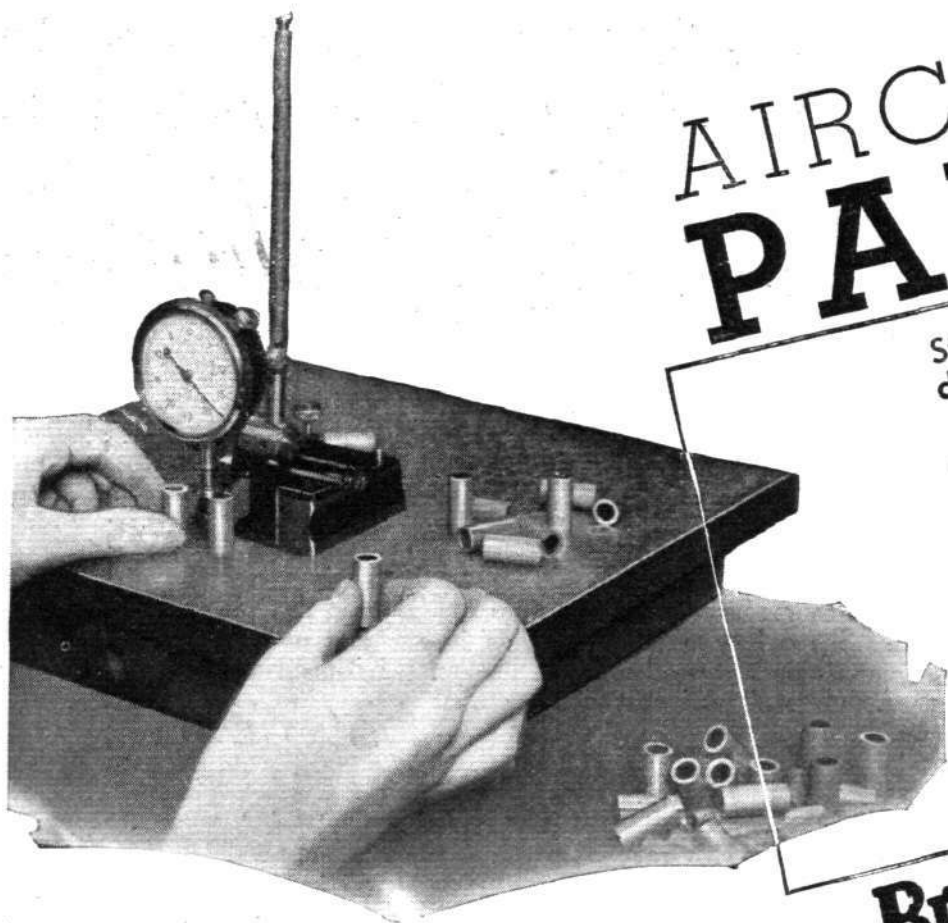
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PRIVATE FLYING

LORD SEMPILL VISITS THE GUINEA GOLDFIELDS AND DESCRIBES THE IMPORTANT PART WHICH AIRCRAFT PLAY IN THEIR OPERATION

ON landing at Port Moresby I found that the pilot of the "Fox Moth" I had seen from the air was Mr. Denny, who had come from the headquarters of Guinea Airways at Wau to meet me. Realising that there were no maps of the country, they had very kindly arranged for him to show me the way into the interior.

Having been asked to dine with the Lieutenant Governor, Sir Hubert Murray, I stayed the night at Port Moresby and was very glad indeed to have the opportunity of learning from its chief representative something of the fine work that is being done to develop the country. Sir Hubert, who is a brother of Sir Gilbert Murray, has been in Papua for a long time and is a remarkably well-informed man.

On the next morning Mr. Denny and I started out quite early, and I followed him for two hundred miles into New Guinea to Wau, which is the main aerodrome serving the goldfields. Mr. Denny, who was in the Royal Australian Air Force, is an excellent pilot and a most competent man, typical of that fine body of airmen who have made unique flying history in New Guinea. My first flight over these mountainous regions brought home to me the arduous conditions under which air transport operates in that part of the world. Without maps, Mr. Denny's guidance gave me a sense of security as we climbed through the clouds to 12,000 feet. After two hours' flying he started to come down through the various cloud layers and presently I saw a collection of buildings and then a long landing strip sloping steeply upwards, on the side of which were various aircraft, including three-engined Junkers.

The landing ground at Wau has a gradient of about one in twelve, and the slope is so marked that unless aircraft have very efficient brakes, chocks have to be placed under the wheels before the pilot switches off the engine to prevent the machine running backwards down the hill.

Heavy Rain

WE found on landing that there had been doubt as to whether we should be able to make it on that day, as there was a lot of heavy cloud in the interior. As is often the case there had been a tremendous flood of rain during the night, and I was told, in fact, that the landing strip resembled a mountain torrent. Had not the ground been on a slope it would almost certainly have been unsuitable for landing on the morning of our arrival.

Although air transport has been utilised to good effect in gold-mining regions in various parts of the world, the part played by aviation in the opening up of the New Guinea Goldfields is unique, and there is probably no more romantic air service in the world to-day than that of the pioneering company, Guinea Airways, Ltd. When, in 1926, rich gold discoveries were made by prospectors at Edie Creek, the difficulties of transport threatened substantially to curtail operations. Native carriers could travel only about five miles a day, and a large proportion of their carrying capacity was taken up in the conveyance of food for the journey from the shore base to the goldfields. Added to the difficulty of foot transport was the danger of attacks by the uncivilised natives who, not unnaturally, resented the coming of the white man. It was recognised that if these valuable deposits were to be worked profitably some other means of transport must be found, and the newly formed company, Guinea Gold, N.L., decided to inaugurate a service by air. For this purpose a D.H.37 machine was

New Guinea's Goldfields

acquired and operations were commenced in April, 1927. At the end of the year Guinea Airways, Ltd., took over the service and in 1928 purchased two Junkers W.34 machines. An enormous amount of freight was carried from the shore base to the mining centre from the inception of the new company; everything was carried by air; machinery, stores and equipment of every description as well as passengers and the gold was conveyed by the same means.

Guinea Airways air fleet consists of four Junkers—two W.34s, one G.31 and one F.13; two "Gipsy Moths"; two "Fox Moths," and a Ford Tri-motor. The company operates, in addition, three Junkers G.31 machines owned by Bulolo Gold Dredging, Ltd.

Up to the end of November, 1934, the total amount of cargo carried was 21,400 short tons. The mileage flown was 1,882,160, and the number of flights made 17,306. Apart from the freight conveyed 24,760 passengers were carried during this period. The present carrying capacity of the company's fleet per trip works out at 17.2 tons, so that on the basis of three trips per day for six days a week, the total tonnage which can be transported in one week amounts, therefore, to 309 short tons.

Fantastic Fact

AS I flew over the Bulolo River and saw one of the dredgers used in the recovery of gold, it seemed fantastic when one realised that every pound of material for the erection of this vast mechanical contraption, weighing well over a thousand tons, had been brought in by air—mainly on the three-engined Junkers.

Other flying organisations which have done good work in New Guinea are Holden's Air Transport Services, Ltd., and Pacific Aerial Transport, Ltd. The first-named company owed its inception to Captain L. H. Holden, A.F.C., M.C., well known as the pilot who was responsible for the rescue of Kingsford Smith and Ulm when the "Southern Cross" was lost in North West Australia in 1929. He realised the field for air transport in New Guinea, the growing mining community having to rely almost entirely on supplies brought by aeroplane, and in 1931 commenced operations from Salamaua to Wau with a D.H.61 machine on which he had previously engaged in commercial flying in Australia. So appreciated were the possibilities of the service commenced by Captain Holden that when he was unfortunately killed as a passenger when on a visit to Sydney for the purpose of acquiring a second machine, the local residents readily helped to find financial support for the purpose of forming a company to continue his work. With a capital of £25,000, this company showed a good profit on its first year's operations.

Future Possibilities

SUBSTANTIAL as the gold-mining industry has become, the possibilities are by no means exhausted. In its further development aircraft are likely to play an even greater part than hitherto. The utility of the aeroplane for prospecting purposes has already been proved in other regions, and it is understood that Messrs. Hemming and Partners, who have already been engaged on survey and photographic work for the Bulolo Company, will shortly begin the survey of a large concession obtained by the Oroville Dredging Co., Ltd. It is proposed to carry out this work with a Short "Scion" seaplane from bases on the Fly River. Gold has already been found on parts of this concession.

Private Flying**FROM THE CLUBS***Events and Activity at the Clubs and Schools***CAMBRIDGE**

For several days last week's weather prevented any form of flying by machines of Marshall's Flying School, Ltd., and the Cambridge Aero Club. However, in the quiet periods between gales 17 hr. 30 min. dual and 4 hr. 50 min. solo were flown. Mr. Whittet made his first solo flight, and Mr. Saint and Mr. Pirie joined the School. On Sunday ten members of the Civil Aviation Service Corps attended.

HANWORTH

Very bad weather prevented the eight machines booked at Hanworth for the Reading "Dawn Patrol" from leaving the ground. Three non-flying days were logged, cutting down the total flying time for the week to 26 hr. 50 min.

Sir John Lavery was flown over to Ireland last Monday, and other cross-countries have been made to Southampton, Brighton, Blackpool, and the Isle of Wight.

Mr. P. Dick has taken delivery of his new Monospar. Messrs. Hamblen Thomas, Gibson Sutton, and J. D. Polson have become members of the club, and Messrs. F. J. Hayes and M. John have passed their "A" licence tests.

CASTLE BROMWICH

Flying times for the week were 8 hr. 40 min. dual and 9 hr. 30 min. solo. New members include Messrs. F. Peltzer, D. R. Scott, J. G. Procter, P. M. Hasluck, F. L. Smith, W. S. Law, and T. MacCabe. The first three of these are flying members. Sir Lindsay Everard with a party, Col. Shelmerdine, Lord Willoughby de Broke, Major Draper, and Messrs. E. D. Winn, Wynne Eaton, and Wilson visited the aerodrome.

Messrs. Maynard Mitchell and A. A. W. Dawkins passed their "A" tests.

The monthly dance, held last Saturday, was well attended. There will be another on May 4.

HATFIELD

Events of the week have been overshadowed by the record flight of the "Comet" from Croydon to Paris.

Mr. Eric Wyllie has taken delivery of a "Leopard Moth" for the Tanganyika Gold and Development Co., and Mr. Higgins, chief pilot of Blackpool and West Coast Air Services, took over a new "Dragon" for his company. Another "Leopard" has been acquired by Mr. Alfred Ellison. Two D.H.86's are awaiting delivery to Imperials and Jersey Airways.

The London Aeroplane Club flew 35 hr. 25 min. last week. Messrs. J. R. Gleed, C. A. Pritchard and C. E. F. Riley have become members.

LEICESTERSHIRE AERO

On Friday, March 15, Mr. Waugh, of Imperial Airways, Ltd., gave a most interesting lecture entitled "Flying over the Empire." The lecture, which was illustrated by a short film and by lantern slides, was given in the new clubhouse and was well attended.

As already recorded in "Commercial Aviation," the new Leicester Municipal aerodrome was licensed on March 27, and the Club moved its flying department in immediately. The days following gave a good indication of the interest afforded. Although there was no official function twenty aeroplanes visited the aerodrome on Sunday, the 31st. The floodlight was tried out on April 6 by Messrs. Stringer and Phillips.

HAMPSHIRE

During March 165 hr. 30 min. flying time was logged, of which 19 hr. 30 min. represents "blind" flying. Five aircraft have been in operation. Messrs. H. E. S. Pritchett and D. Jervis Hamilton, and F/O.s S. D. Slocum and N. B. Littlejohn became members. Four members qualified for "A" licences—Messrs. A. P. T. Pierssené, E. H. Banfield, G. B. Miller and F. W. Young, and Blind Flying Certificates were secured by F/O. S. D. Slocum and H. E. S. Pritchett, the first to be obtained at Eastleigh.

NEWCASTLE-UPON-TYNE

The week's big event was the inauguration of the London-Leeds-Newcastle service. Councillor A. D. Russell, a member of the Newcastle Corporation Municipal Aerodrome Committee, met the first machine, which later left for Edinburgh with the Lord Mayor of Newcastle-upon-Tyne, Councillor R. S. Dalgleish, and Alderman G. Gibbin, Chairman of the Newcastle Municipal Aerodrome Committee, as passengers.

High winds, reaching gale force at times, prevented flying on three days, and cut the flying time down to 32 hours.

BROOKLANDS

Flying hours last week suffered from the heavy rain and persistent gales. Mr. Fred Darling, who was to have flown to the South of France, had to cancel his trip, and Messrs. O'Connell and Valetta, who flew a customer's machine over to Holland, and were to have brought back another aircraft, had not returned by Thursday. In spite of the weather, however, Messrs. Firth and Gold made first solos, and Mr. Broke-Smith has taken his first lesson.

The schools have broken up, and a party of Winchester boys chose to fly to Brooklands, instead of taking the more usual train. They arrived at about 9.15 a.m., and cars were waiting to take them to their respective homes.

The Ethyl Export Corporation, who have just taken delivery of their new "Rapid," are housing this machine at Brooklands, and special petrol is kept for the fuelling of this machine.

A landing competition was held against Reading last Sunday, and, as reported in the Reading notes last week, the Brooklands team carried off the cup. Capt. Mackenzie is making a steady recovery, and it is hoped that he will leave the hospital in a week or so's time.

CINQUE PORTS

On almost every day of the week low clouds and high winds prevented flying, and only 9½ hours were put in. Mr. R. Swinden made his first solo flight. Lt. Col. W. M. Ozanne has become an associate member, and Mr. J. T. Leacock has returned after an absence of nearly a year.

Miss Joan Meakin visited the club on arriving from Germany by towed glider, and Mr. O'Connor and a friend arrived after a very rough passage from Amsterdam. Mr. Cliff visited the club with his bride the day after their wedding to inspect a house in Hythe; he will be taking up duties as No. 3 instructor in time for Easter. Mr. Ken Waller resumed his position as No. 2 instructor on Sunday, having returned from his holiday. Mr. Rea's temporary position as assistant instructor terminated on Thursday, and Mr. Fellows is on holiday.

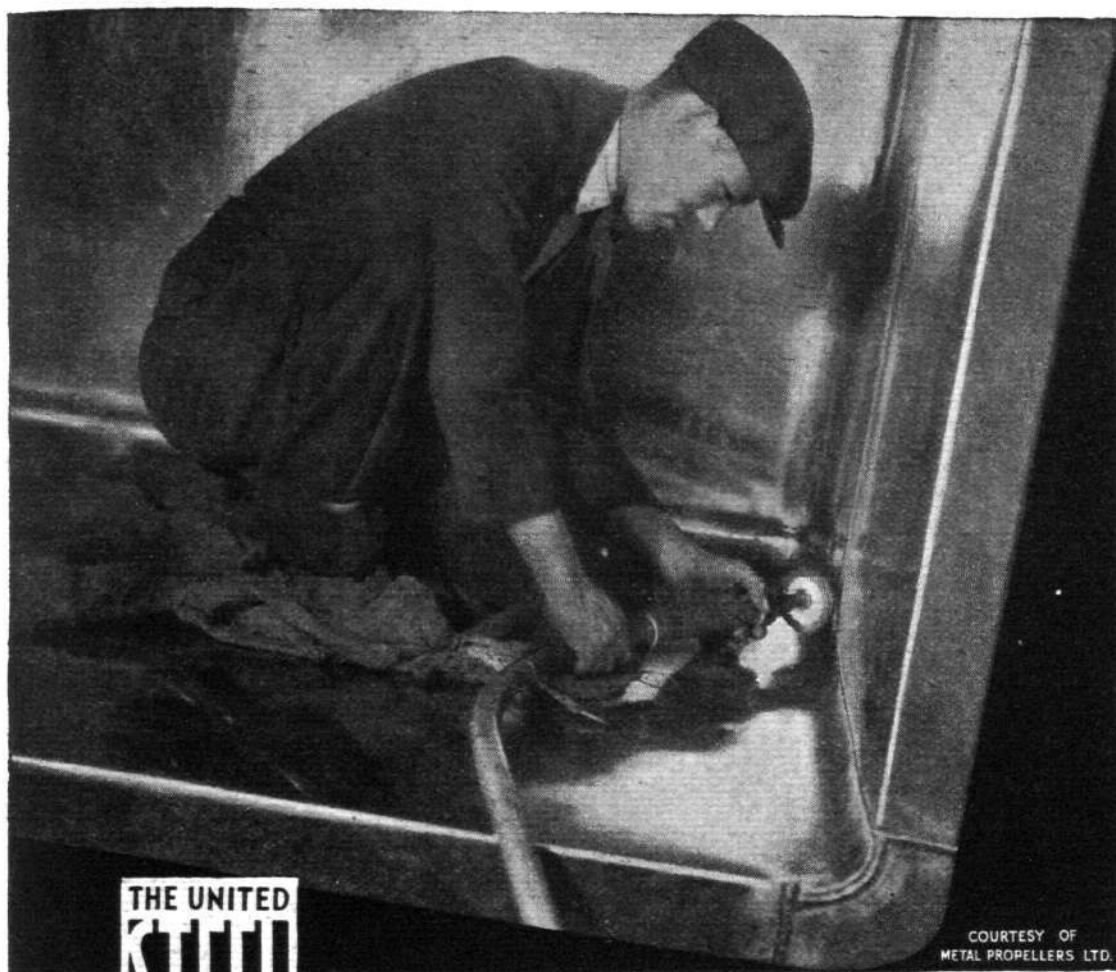
Work on the extension to the club premises will be started in a few days, and should be finished by the end of May.

It has been decided to hold the Cinque Ports Wakefield Cup Race, for which prizes of £50, £25 and £10, in addition to trophies, are offered, on August 24 and 25, coincident with the International Air Rally, and the Folkestone Aero Trophy is scheduled for Saturday, September 14. Trophies and cash prizes of £50, £25 and £10 are offered.

The club will miss Mr. Dupe, the assistant aerodrome officer, who has been advised, on medical grounds, to take a long holiday.

CAWNPORE PERSONALITIES: The "big four" of the Cawnpore Flying Club. From left to right they are Mr. C. O'Malley, one-time secretary, Capt. Riley, the instructor, Mr. Grant Govan, one of the founders and owner of the "Puss Moth" in the background, and Mr. Clifford, the chief engineer.





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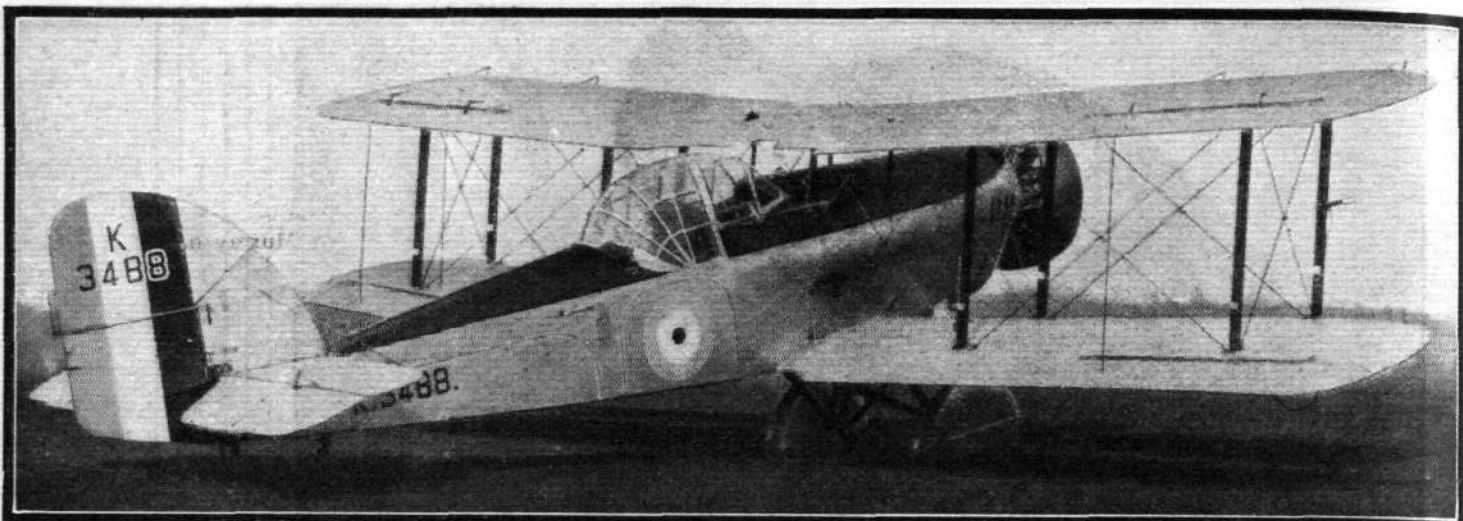
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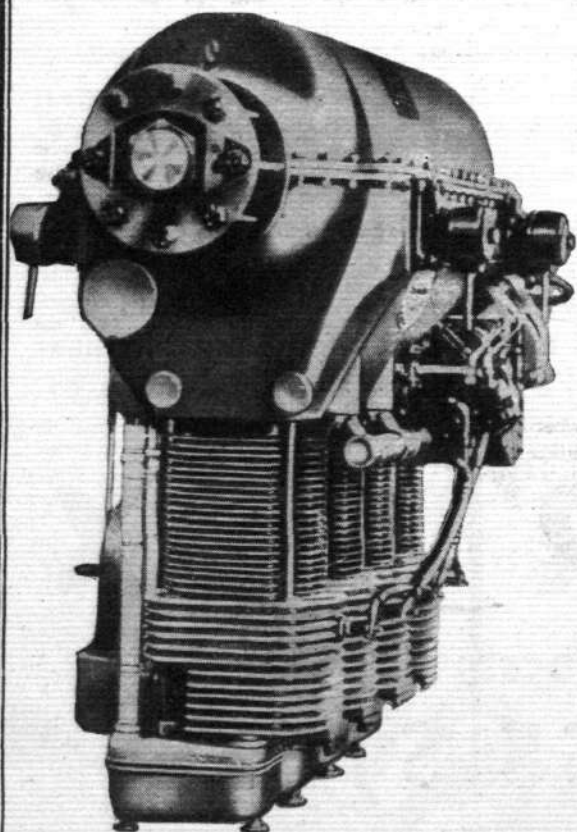
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Private Flying**NORFOLK AND NORWICH**

The club's new "Fox Moth" has made two special charter flights, one to take two members of the Norwich Rugby Club to a match at Mildenhall, and the other a return trip to Birmingham. Visitors during the week included Mr. Norman Blackburn in a "Segrave" monoplane.

REDHILL

Club machines flew 27 hr. 40 min. during the past week. Mr. R. E. P. Bliss is taking a blind flying course for his "B" licence and Messrs. Houston, Lowe, and Place have been flying the "Fox Moth" for "B" licence endorsement.

BRISTOL

On April 12, as recorded elsewhere, Mr. Kronfeld flew to Bristol from Hanworth in a B.A.C. "Drone" in 1 hr. 30 min.

Messrs. B. Douglas and M. F. C. Smith have become pilot members of the club.

HERTS AND ESSEX

In spite of bad weather 46 hr. 15 min. flying, including 18 hr. 45 min. solo, has been flown on club machines.

Messrs. P. W. Lambert, D. Griffin, R. G. Charter, and J. Ekham have become members.

A novelty dance has been arranged for Thursday, May 2, to which members and friends are invited.

LIVERPOOL

On four days of the week gales made flying impossible, but nevertheless 35 hr. 5 min. flying was logged.

With the commencement of Summer Time the flying hours for Hooton and Speke on Sundays are from 10.30 a.m. until dusk. On Mondays and from Wednesday to Saturday the hours will be from 2.30 p.m. until dusk at Hooton, and at Speke from Tuesday to Saturday the hours will be similar.

YORKSHIRE

The outstanding event of the week was the opening on Monday of the London-Leeds-Newcastle Air Line.

Club members flew about 20 hours during the past week. Miss B. F. Hall and Mr. P. L. Pollard have become members.

Eleven members of the Aviation Group are now training.

AIR SERVICE TRAINING

During March 707 hours of instructional flying were logged at Hamble, making a total for the first quarter of 1,788 hours flown. The school fleet now totals thirty-one.

The pupils who entered for the long commercial course last September have completed their first six months of practical training in the workshops and have started their flying tuition. Already three of them have obtained A licences. There are now twenty-three long-course students undergoing their B licence training. The next term starts on May 7. Capt. H. A. Crommelin has completed his instructor's course, and Messrs. H. A. Lowe, T. M. McGrath, F. B. Tomkins, E. R. B. White and L. M. S. Whetham have completed their instrument flying courses. Mr. Whetham is taking up an appointment with the Sperry Gyroscope Company.

The Avro Five has been much in demand for multi-engine experience. Messrs. O. G. E. Roberts and W. J. Scott have been much occupied with it, and the latter has now joined the P.S. and I.O.W. Aviation. This machine has also, of course, been in use for the wireless course pupils. One of these, Mr. K. M. Cass, has obtained his P.M.G.'s W/T Air Operator's licence and has joined the staff of Imperial Airways.

Messrs. R. D. Hanbury and K. T. Murray have successfully completed their B licence technical and flying tests. E. J. Finnegan, who is, among others, awaiting his ground engineer's examination, has joined Imperial Airways.

Capt. E. R. B. White, of Imperial Airways, has taken the examination for his First Class navigator's licence, and Messrs. A. E. C. Booth, J. L. M. Davys, R. J. Makgill, H. D. Primrose and E. Rotheram were examined for the Second Class licence. No. 7 Navigation Course, in preparation for the examination in October, will commence on Tuesday, May 7.

Lord Malcolm Douglas-Hamilton is the latest addition to the staff of flying instructors.

Another Long-distance Instructional Flight

As already recorded in *Flight*, plans are being made for another instructional flight to England by the Bombay Flying Club. At present the arrangements are that four "Moth" machines will make the trip. This time, instead of travelling via Egypt and south of Italy, it is planned to go across Turkey. Mr. Gazdar, the Club's pilot instructor, will be in charge of operations, and it is possible that the flight may be accompanied by Flt. Lt. Gordon Carey, the Secretary of the Aero Club of India and Burma, who will, presumably, take his Miles "Hawk."

Two International Events in France

The regulations for the two principal international races to be held in France during 1935 have now appeared.

One, the Grand Prix, organised by the Aero Club of France, will be held on July 20 and 21 and is open to single-seater and other machines possessing a normal certificate of airworthiness and with an engine or engines of less than eight litres capacity. The route will be, as usual, from Deauville to Cannes and return, and entries at normal rates, must be received on or before May 15 or, at double rates, on or before July 1. Prizes to the value of 200,000 francs are involved, with a cup presented by M. Armand Esders.

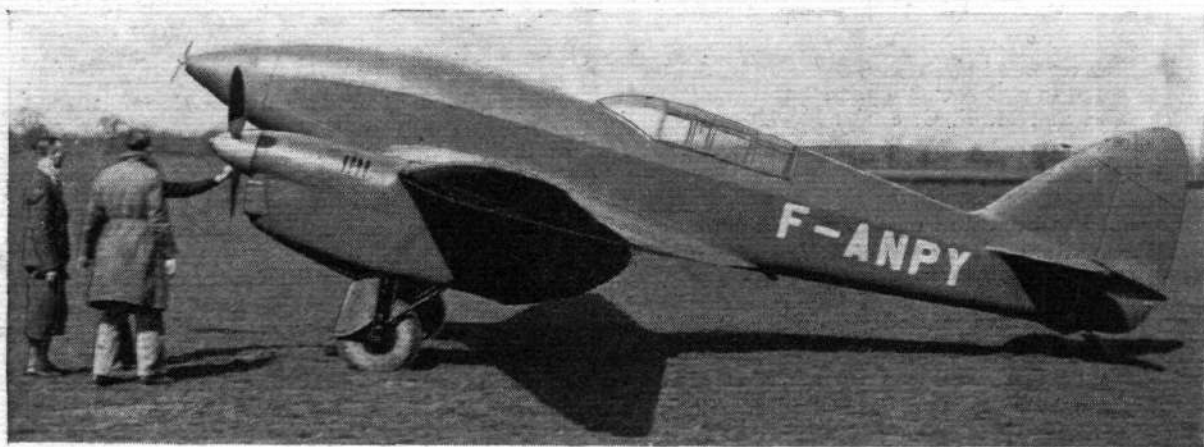
The second, *Les Douze Heures d'Angers*, will be held at Angers on July 2 and is organised by the Aero Club de l'Ouest. Again it is limited to machines with engines of less than eight litres capacity, but is won by the pilot putting in the greatest number of miles in the twelve hours over circuits. Entries, at increasing fees, can be taken until June 14. Sums totalling 100,000 francs can be won, and there are both open and tourist classes.



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COMMERCIAL AVIATION

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PARIS WITHIN THE HOUR: The D.H. "Comet" for the French Air Ministry which, in the hands of Mr. Buckingham, flew from Croydon to Le Bourget in 54 minutes. This machine, one of two ordered, will probably be used on the French mail route across the South Atlantic, with Jean Mermoz as pilot. (Flight photograph.)

CROYDON

The Paris "Record" and Others : The Zurich Service : Summer Time Changes : K.L.M.'s First Douglas

LAST week was one of very greatly improved flying weather and there was no longer any talk amongst pilots of ice formation. There were, however, stiff winds from which some of the lighter aeroplanes suffered. Pilots accustomed to flying the heavier air liners notice the difference very much when they take a turn with the new, fast, and much lighter types. Considering the weather, since it started the Imperial Budapest service has been very successful.

The week was one of records. London-Paris was snatched from Air France by a bright-red streak of lightning bearing the French registration F-ANPY, the "Comet" flown to Australia and back by Cathcart Jones and Waller, and this time flown to Paris by Hugh Buckingham, with Mr. Martin Sharp as passenger.

The machine flew low over the Croydon control tower and was "clocked out." On the way the weather was such that part of the time the machine had to be flown throttled back and a direct course could not be flown. Nevertheless the trip was made in fifty-four minutes, and the machine was duly handed over to the French Government. I suppose this is really a French record as the machine bore French registration.

K.L.M. made a "record" to Rotterdam during the week and then broke it the following day. The first was by an F12 piloted by J. Hongdong, which did the trip in sixty minutes, from take-off to landing, and the second was by Fryns with the fast F26, which made a tarmac to tarmac time of sixty minutes, or fifty-seven minutes from take-off to touch down.

Returning to the "Comet" trip, one newspaper, in an ecstasy of fine, confused writing, described it as having been performed by Mr. Hugh Buckingham, with his pilot, Mr. Martin Smith. Mr. Sharp has an "A" licence!

Swissair services have been operating with considerable success and the "Douglas" seems popular. Stewardesses add a new and cheerful note to European travel, though it is doubtful if the idea will spread. Illogically, perhaps, we associate male waiters with first-class service, in this country at least. The famous M. Mittelholzer took one Swissair service last week, but he was only at Croydon for forty minutes. The two pilots who are doing the service regularly at present are Messrs. Zimmermann and Heebmanek. I hear that several full loads are booked for next week. The Swissair uniform is extremely smart. It is the same colour as the British R.A.F. uniform, but with gold braid rank badges.

British Summer Time will make some difference to schedules. Air France announces more and better air mail connections, and the last K.L.M. service will come in at 10.50 instead of at 9.50. This will often mean a much later arrival, as the last machine from Holland picks up connections from a very large number of European cities.

The companies are now being asked to move from their old quarters in the "Import" sheds to new ones on the other side of the building, as the structural alterations—for better passport examination facilities—are really well on the way towards completion at last.

I hear that Sqd. Ldr. Spence, of the control tower, is leaving us to return to the Air Ministry in London. He has not been with us very long, but everyone at Croydon will be sorry to lose him.

I understand that one K.L.M. Douglas machine has already reached Amsterdam, and that another is expected shortly. Pilots are already being passed out on these machines, which are to be used on the Amsterdam-Batavia line, and only occasionally in Europe.

Imperial Airways Accounts Department is moving to the building in Stafford Road which was originally occupied by the "Wizard" plug company. The accounts of a company such as Imperial Airways, dealing with every European country and with the finance of the Empire routes, is a most complicated business. The department has outgrown its aerodrome premises, and it is perhaps fitting that these wizards of finance should move to the "Wizard" factory. A. VIATOR.

"Perseus's" for the Scylla

Some time this year four Bristol "Perseus" sleeve-valve engines will be installed in the Short "Scylla" in place of the "Jupiters" used at present. The combination will then be tried out in regular service prior to the new power plant being put into production.

It is expected that the "Scylla's" cruising speed will be raised 8 m.p.h. by the substitution, requiring about 60 h.p. more in cruising output from each of the four "Perseus's" than is taken from the poppet-valved "Jupiters." Despite this power increase fuel consumption of the four "Perseus" units is expected to be two gallons an hour less. The maximum range should be increased by fifty miles, and the estimated service ceiling is up by 1,000 feet.

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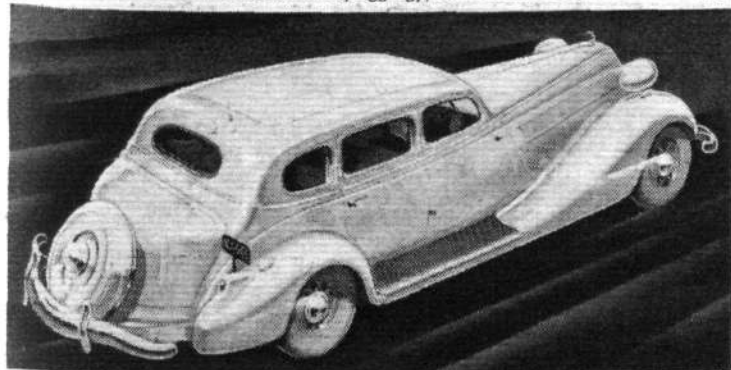
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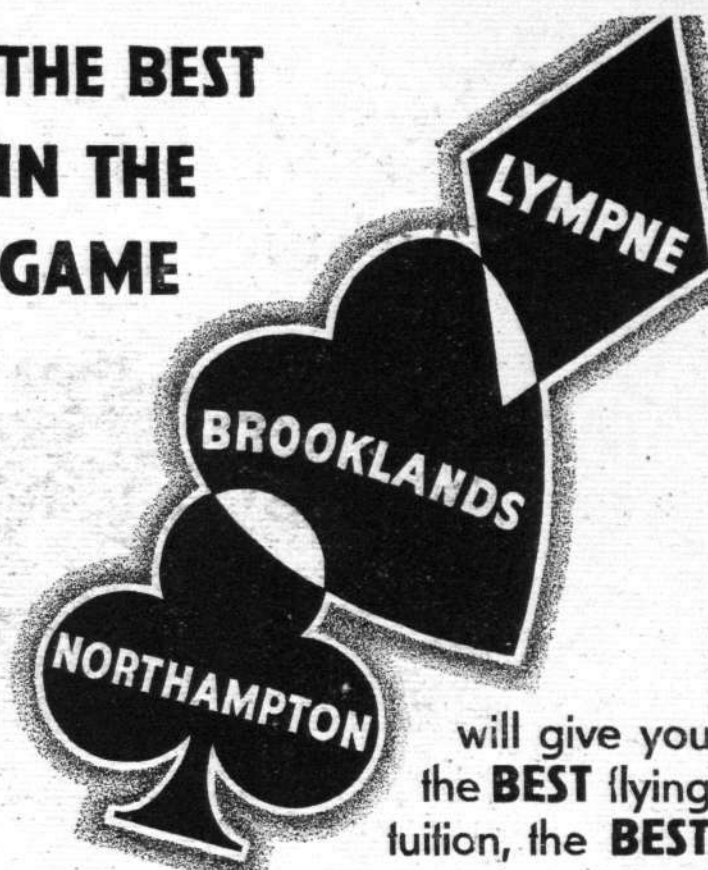
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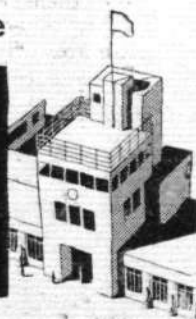


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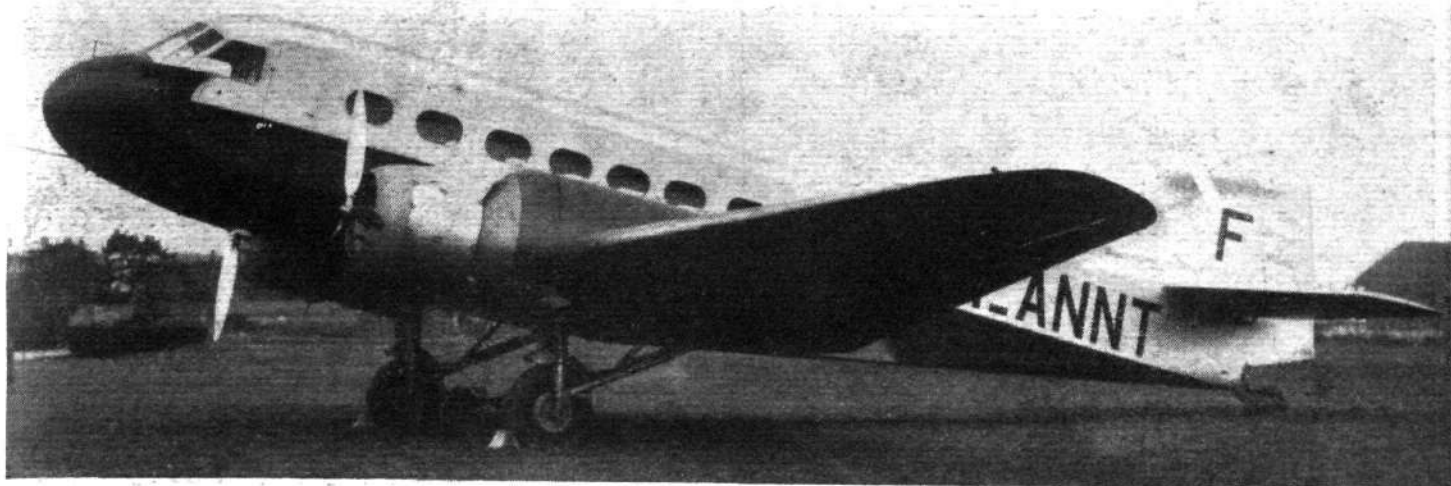
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Kindly mention "Flight" when corresponding with advertisers.



A PRODUCT OF POOLED RESOURCES : The new Breguet-Wibault 670 (two 900 h.p. "Mistral Majors") which has a top speed of 219 m.p.h. and, on 62½ per cent. of its power, carries eighteen passengers at 186 m.p.h. It will shortly be presented for its official test.

Cardiff—Swansea—London

A Monospar was used recently in an experimental flight between London, Cardiff and Swansea. Capt. W. R. Bailey is chairman of a new company, Bristol Channel Airways, Ltd., which may operate such a service in the near future.

Another Algiers Service

On and after May 1 the Air France service to the Balearic Islands and Algiers will be run on Fridays as well as Wednesdays and Sundays. In the reverse direction it will be possible to fly straight through to London on Tuesdays, Thursdays, and Saturdays.

Air France and Africa

It is reported that Air France, who already operate a service to Prague, will be responsible for an extension thereof to Moscow. This extension will pass through Uzhhorod (Carpathian Ruthenia), Cernăuți (Rumania) and Kieff.

Commandant Dagneux, who is in charge of the Congo extension developments, announced last week that he proposes next month to inaugurate a service between Casablanca and Tunis, thus eventually linking Portugal with her African colonies, Angola and Mozambique. Which suggests that Air France, with their Congo-Algiers service in action, are thinking seriously of a west coast route to the Cape.

When the Congo line carries passengers it is probable that Brazzaville will be linked with Broken Hill and with the Madagascar service.

Incidentally, the mail is now being flown by South African Airways from Kimberley to Windhoek. No definite information is yet available concerning either the Windhoek to Cape Town service or of internal development in South West Africa.

At Heston

The new block of offices is now complete and occupied. Air Commerce, Ltd., North-Eastern Airways, Ltd., Air Hire, Ltd., Standard Telephones and Cables, Ltd., a new company, British American Air Services, Ltd., and Warden Aviation, Ltd., all have their offices in this block. In the course of the coming week Jersey Airways, Ltd., and Spartan Airlines, Ltd., will be moving into two offices in the central building, with a counter in the Traffic Hall. Brian Lewis and Co., Ltd., Henlys Ltd., Malcolm and Farquharson, Ltd., will be retaining their present quarters in the central building.

It is not necessary for tourists to worry over international time-tables. The Airwork Traffic Office can arrange at short notice tours by air, calling at specified points, and booking of all necessary transport, both ground and air.

On April 7 Herr Kronfeld, the gliding expert, flew with two passengers to Ostend and back in a "Leopard Moth" from Air Hire, Ltd. Mr. John Grierson, of Arctic Transatlantic fame, also left Heston on the 9th with his wife and another passenger for an eight-day continental tour in a "Leopard Moth" hired from the same firm.

Jersey Airways, Ltd., will be running twice daily each way between Heston and Jersey on the Thursdays and Fridays before Easter, but once daily as usual on other days. The Thursday services will leave Heston at 9 a.m. and 1.45 p.m., and the Friday services at 9.30 a.m. and 2.15 p.m.

Five Years of K.N.I.L.M.

On March 4 it was five years since the Royal Netherlands Indies' Airways opened their weekly air service between Singapore, Palembang and Batavia. This fact is the more noticeable because on the same day Singapore could commemorate the date on which it was used for regular civil air traffic. The pilot of the first service machine was Mr. Moll.

In their five years of operation the K.N.I.L.M. have made 261 flights to and from Singapore, all punctually to schedule. 2,948 passengers, 78,000 lb. of freight and 12,000 lb. of mail were carried during the period.

A New Charter Company

Another operating company, with offices at Heston, has been formed under the name of British American Air Services. The directors are Mr. D. S. Gibbs, Mr. M. Peto, Mr. D. C. Jewson, and Mr. A. J. Edmunds, of Warden Aviation and Aeronautical Advertising, Ltd. The company has placed an order with Brian Lewis and Co., Ltd., for a D.H. "Rapide" and a second-hand D.H. "Dragon," both fitted as six-seaters, and also for a D.H. "Leopard Moth." It is intended to do private charter business and to operate special air services to a number of events connected with the Jubilee celebrations.

Linking London's Airports

Commercial Air Hire, Ltd., with their new enterprise, Inner Circle Air Lines, which opened with a Croydon-Heston service on Sunday, have supplied something which is badly needed and which is almost certain to develop into a big thing in time. The numerous air lines which either exist or will exist, with Heston as their London terminal, will be linked up with the air routes centred on Croydon and linking London with an ever-increasing number of Continental towns.

Another aspect of the inter-airport link is that it will afford reasonable transport for the numerous representatives of firms engaged in the manufacture and supply of aviation accessories.

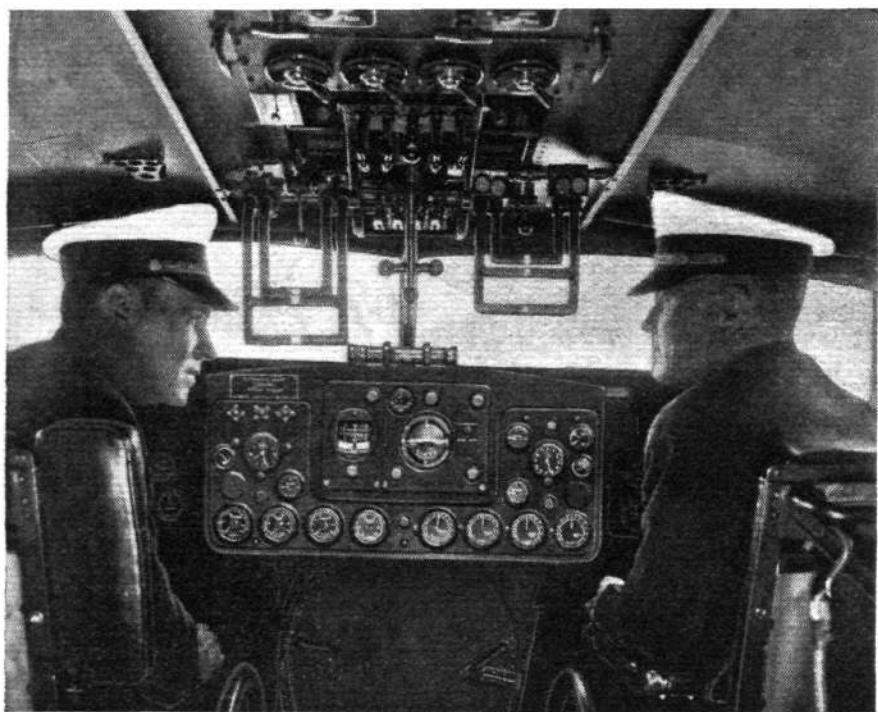
Tests made the other day showed that by bus, train, bus again and taxi, it took four and a half hours to reach Heston from Croydon, and cost 8s. 10d., as against a return fare by air of 10s. 6d. and a return journey of half an hour.

By taxi all the way, paying little regard to the 30 m.p.h. limit, the journey took sixty minutes and cost 27s. 6d. single. There will doubtless be quite a number of season ticket holders, and a number of travellers from the Continent will surely make use of this link.

Later, it is hoped that there will be an Outer Circle also, via Hatfield, Brooklands, Rochester, Gravesend and Stapleford Abbots, and this will link up with the Inner Circle at two points—Stapleford Abbots and Heston.

Freight will be carried at 1d. per lb. (minimum 1s.) up to 100 lb., after which it will be ¾d. per lb. This will be a great boon to aircraft component and accessory manufacturers with rush orders from the Continent.

Machines at present leave Croydon at 9, 10.30, 2.30 and 6.30, and leave Heston at 9.30, 11.15, 3.45 and 6.50. With the new zone control system the pilots will have a busy time in thick weather reporting themselves out of one zone and into another! The "Dragon" which is being used has, fortunately, a fixed aerial.

Commercial Aviation

THE THIRD PILOT: The control room of Pan-American Airways' special long distance Sikorsky S.42, which is now at San Diego, California, preparatory to making its first experimental trip across the Pacific. During the recent 2,504-mile test flight from Miami to the Virgin Islands and back, the Sperry Gyropilot was in control for two-thirds of the time, while Capt. E. C. Musick (left) and First Officer R. O. D. Sullivan attended to the navigation and to the experimental equipment.

The first lecture will be held at the offices of the Guild, at 61, Cheapside, E.C.2, and those who wish to attend should apply to the Clerk at this address.

To the Isle of Man

On Monday Railway Air Services opened their new route between Manchester (Barton), Blackpool and the Isle of Man. Two services are provided daily in each direction, and D.H. "Dragons" are being used for the present. At Barton the service connects with that between London, Belfast and Glasgow.

The company's other new services have not yet been definitely settled, but the timetables should be appearing during the present week. United Airways, Ltd., will definitely open their Heston, Blackpool and Isle of Man service on May 1, though the entry of Northern and Scottish Airways, Ltd., with a Glasgow extension, is not likely to take place until later.

Saharan Beacons

It is reported that a night-flying beacon is to be erected at Bidon Cinq in the Sahara. This will be eventually one of a series, and day signs are to be laid out at intervals of about six miles.

New Appointment to Hillman's

Maj. J. R. McCrindle has been appointed managing director of Hillman's Airways, Ltd. Maj. McCrindle was, after service in the R.F.C., formerly attached to the British Embassy in Paris, and was in charge there of the R.A.F. Peace Conference air service between London and Paris.

As already recorded in *Flight*, Hillman's Airways has ordered six D.H. 86s for extensions to their existing Continental services. Special arrangements are being made for transport to the Brussels exhibition.

Mishap to the Graf Zeppelin

After flying well over 600,000 miles and making some ninety Atlantic crossings, the *Graf Zeppelin* was unlucky enough to touch a house while mooring at Pernambuco on her second trip of the season. It was raining at the time and bad weather, combined with the weight of water in the envelope, caused the ship to lose height rather quickly, and the mishap occurred while the commander was making a second circuit after pouring out ballast.

In New Zealand

East Coast Airways and Great Pacific Airways have now been granted licences to operate air services in New Zealand. Most of the capital of East Coast Airways has been subscribed by the Union Steamship Company, and licences have been issued subject to the use of British machines. Sqn. Ldr. MacGregor, as announced in *Flight* of March 28, is chief pilot and manager.

Air Mails to Canada

The Postmaster-General announces that with the opening of the St. Lawrence River, correspondence for Canada marked "By Air Mail," and sent by week-end sailings of the Canadian Pacific Railway Company's steamers from Glasgow or Southampton, will again receive onward conveyance by air from Rimouski, on the St. Lawrence, to Montreal, thereby gaining about one day to Montreal, Ottawa and Winnipeg, and up to two days to British Columbia. The first despatch will be by the *Duchess of York* sailing from Glasgow on April 13. The inclusive air postage rates are letters 2d. per half ounce and postcards 2d.

For the October Navigators' Examination

The G.A.P.A.N. has decided to hold a series of lectures, as foreshadowed in *Flight* of April 4, during the summer in connection with the October examination for Second Class Navigators. These will commence on Thursday, April 25, at 8 p.m. and will be held twice weekly in the evenings.

Fast New Avros

Performances attained by some of the latest British commercial aircraft make an excellent showing even when compared with the figures achieved by idolised foreign examples which are considerably less economical in operation. For example, it is announced that two special versions of the Avro 642 (which, in its original form with two "Jaguars," was described in *Flight* of April 5, 1934) will have maximum speeds of 175 m.p.h. and 190 m.p.h.

One, which will be known as the "Speed" model, is powered with two Siddeley "Panthers" supercharged to give 560 h.p. at normal r.p.m. and 6,000 ft., at which altitude it attains its 175 m.p.h. The "Express" model also has two "Panther" engines, but they are supercharged more heavily and develop their normal power at 12,000 ft. At full throttle and 13,500 ft. the "Express" does 190 m.p.h. The economical cruising speeds of the two models are 150 m.p.h. and 160 m.p.h. respectively.

Each machine will accommodate twelve passengers, a crew of two, and will carry 400 lb. of baggage, wireless or other equipment. The normal cruising range is about 500 miles, and the absolute ceiling of the "Express" model is no less than 26,800 ft. Climb from sea level to 15,000 ft. takes 16.8 min. In both cases the gross weight is 12,500 lb.

THE NEW ZONES:
A sketch map showing the extent of the areas controlled by Croydon, Heston and Portsmouth. Details were given in last week's issue.



MODELS

The American Fashion : An Efficient High-wing Monoplane : Miniature Sky-writing

SUPER-REALISM

AS everybody who has studied America's popular aviation magazines knows, scarcely does a single new type of aeroplane appear than the model market is flooded with the appropriate scale drawings and construction kits for building flying scale models. These drawings have recently become popular in England, and the realistic model shown in the heading is made from a set of them. The machine will be recognised as the new Northrop FT1, which was described in *Flight* of February 7.

Of balsa construction throughout, the model has a wing-span of 22in., and weighs 2½ ounces. Its construction includes one or two interesting ideas. The fuselage is built up on the "keel" system, i.e., the bulkheads are first assembled on two "keels," top and bottom, which are cut to follow the shape of fuselage. The stringers, of which there are a considerable number, are then assembled round the bulkheads, fitting into small, square slots.

The rubber motor is housed in a hollow, square-section spar which is attached to the engine cowl, which may be removed, bringing the spar with it for inspection of the rubber. When in position the spar rests in square sections cut out of each bulkhead.

The model is finished in aluminium with the usual American insignia, and has been built by Mr. E. Ross for Hamley's, of Regent Street, London, as a show model. Two test flights of 20 sec. duration were made.

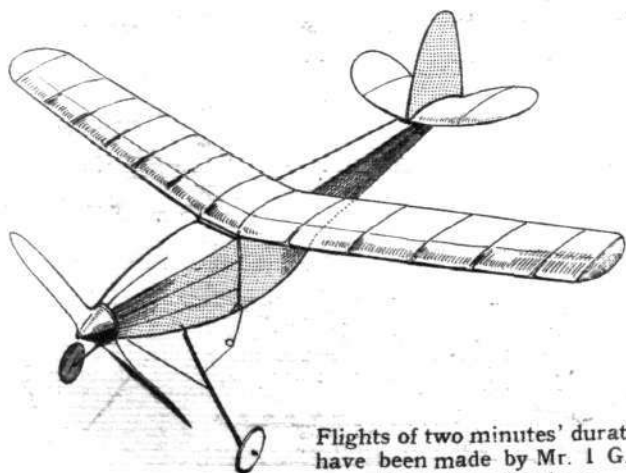
THE BROWN MONOPLANE

SEVERAL interesting—although, perhaps, not particularly startling—features are embodied in the monoplane designed and constructed by Mr. I. G. O. Brown, of No. 10 Group (Wimbledon), T.M.A.C., and illustrated in the sketch below. It is a very successful model, and has been a regular and consistent performer at many flying meetings, giving equally happy results either in the hands of its designer or when loaned to "outsiders."

Perhaps the first characteristic that claims attention is the somewhat unusual shape of the fuselage, which is of rectangular section for the forward half, and thence triangular to the tail. There is thus a certain saving in weight for the rear portion of the fuselage, and this method of construction is certainly very strong and rigid.

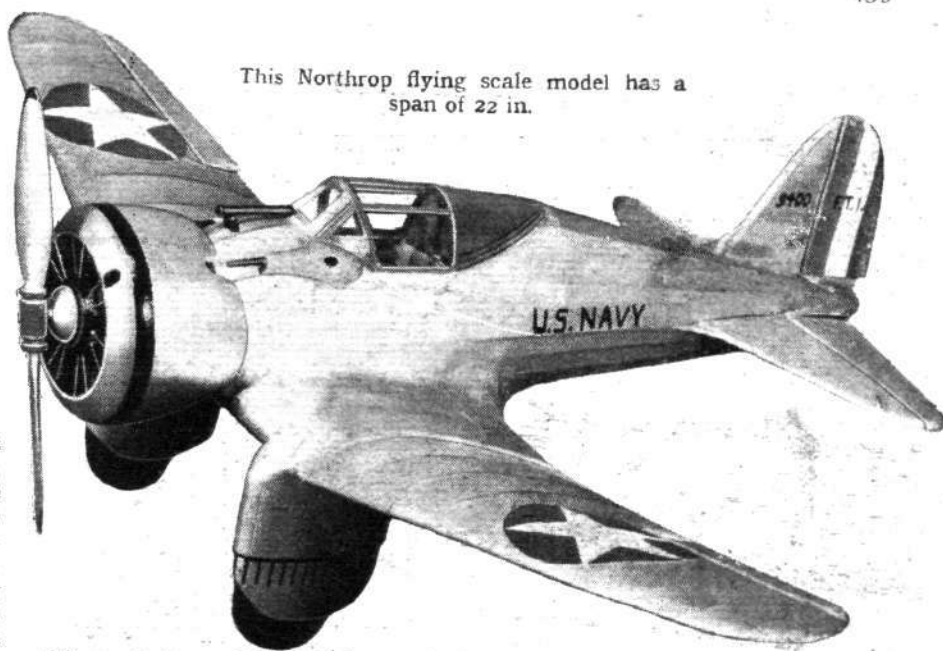
The fuselage is built up of spruce longerons and alder bulkheads, and is covered with one piece of fabric, aluminium-doped.

The wings, which have balsa ribs of fairly thick section, are built up as a single unit, with a dihedral angle of about 5 deg. and a slight back-sweep on the leading edge.



Flights of two minutes' duration have been made by Mr. I. G. O. Brown's monoplane

This Northrop flying scale model has a span of 22 in.



Tail and fin are built up separately, of 20g. wire, the former having a certain amount of lift and a slight dihedral angle. The undercarriage, of the spring rocker type, is fitted with celluloid-cum-balsa wheels on ebonite bearings. The rubber motor is geared and consists of two skeins of six strands of ¼in. elastic; four strands of the same elastic have also been employed successfully. The airscrew, which is 12½in. diameter, is not only set to give a slight downward thrust, but is also set to pull to the right, to counteract torque. Principal characteristics are:—

Span, 40in.; chord, 5½-4½in.; overall length, 28½in.; dihedral, 5 deg.; weight, 6½ oz.; duration, 60-120 sec.

SKY-WRITING

AT most model aircraft rallies, especially when the general public are admitted, something spectacular is usually in demand, and here is an idea that is a distinct change from parachute dropping.

Mr. L. J. Hodson, of Windsor M.A.C., has evolved a simple and efficient method of laying a heavy smoke trail from a model in flight. The "business end" of the apparatus is a cartridge made of two 1ft. lengths of 35 mm. cinematograph film placed edge to edge (not end to end), laid on a strip of paper, and rolled up in it to form a cartridge slightly under ¼in. in diameter, a few extra turns of paper being given to form a case. One end of the cartridge is then tucked in, so that it is more or less airtight, and the other trimmed off level with the edge of the film.

Unfortunately we have not the space to describe Mr. Hodson's drilled strip aluminium carrier which slings this cartridge about half-an-inch below the fuselage, but experimenters should easily be able to make their own; two important features are a flame shield, about 1in. square, above the vent end of the cartridge carrier, and a metal disc at the forward end to prevent the front of the cartridge blowing out.

Having the model ready for flight, the procedure is to light the cartridge, wait until it is well alight, and then blow it out, when the celluloid will emit dense vapour, which will continue for some thirty seconds.

BRITISH CHALLENGERS

AT Fairey's Great West Road Aerodrome, on Easter Monday, the S.M.A.E. is to hold its eliminating trials to select a British team of six models for the International Moffett Trophy competition in America. The trials will begin at 3 p.m.

The American event is to take place at St. Louis on June 29.

THE WAKEFIELD CUP

RULES for the International Wakefield Cup Competition, to be flown at Fairey's Aerodrome on Monday, August 5, are now available, and may be obtained from the competition secretary of the S.M.A.E., Mr. B. K. Johnson, 58, Norton Road, Wembley, Middlesex. Duration averaged over three flights will be the deciding factor, and all models must be R.O.G. There is no entry fee for members of the S.M.A.E. or affiliated clubs; for others the fee is 2s. 6d.

THE WINNER

AT the recent Skybird League Rally, the *Flight* prize was presented to Mr. M. J. Frisby (Club 150) for a model of the D.H. "Comet."

THE INDUSTRY

COMPLETING THE PASSENGER'S COMFORT

AS all who use them are aware, air liners equipped for long-distance work are luxuriously fitted; yet it is a fact that in some cases the lavatory arrangements are hardly in keeping with the rest. Manufacturers and operators will therefore find interest in the products of a firm making modern equipment in this line—James Beresford and Son, Ltd., Cato Street Works, Birmingham.



The Beresford wash-basin in its extended position. Made entirely of aluminium, it weighs 7½ lb.

Where space is restricted and, as in aeroplanes, weight is a consideration, the Beresford patent wash-hand basin (illustrated here) is admirable. Constructed throughout of aluminium, it folds against the wall when out of use, and the act of folding drains away the used water. Its weight is only 7½ lb. When in use, the basin projects 12½ in. and is 16½ in. wide; the height of the fitting is 21¼ in.

Of particular interest is the aircraft water-closet, which has

a special two-gallon water tank with a hand-operated air pump and pressure gauge. The hopper has a pedal to operate a valve so constructed that it closes after the pedal has been depressed for a short time. Unnecessary water wastage is thereby avoided, and, due to the fact that the water is fed to the hopper under pressure, a very small quantity suffices to give a perfect flush. Actually, the storage tank holds sufficient to flush the hopper thirty times. The entire equipment weighs only 40 lb., of which 20 lb. is water, the tank and hopper weighing 10 lb. each.

Across the seat from front to rear the measurement is 1 ft. 4 in. and the width is 1 ft. 3 in. The overall height is 1 ft. 5 in. The diameter of the storage tank is 10 in.; it is a vertical cylinder, and the height from the floor to the top of the pump handle is 1 ft. 9 in.

A NEW OLEO-PNEUMATIC STRUT

A SIMPLE oleo-pneumatic shock-absorber strut has recently been put on the market by Vickers (Aviation), Limited. It consists essentially of an air cylinder and a piston, the working gland between the piston and the cylinder being oil-sealed to prevent air leakage. Compressed air is used as the springing medium, and there is an internal oil brake and rebound damper which dissipate the energy of landing and damp out oscillations.

Two of the outstanding qualities claimed for the leg are lightness and the readiness with which the air pressure and compression ratio may be varied. The latter property makes the strut very adaptable.

Compressed air and a mineral oil are contained in the strut, the oil, which is used in the brake and damper, lubricating all the working parts. A specified amount is put into the unit on assembly, and, since the main gland is oil-tight, there is no need to check this quantity unless any has been inadvertently lost through the valves, or if there is any reason to believe that an excessive quantity of oil has been blown in when the air pressure is being adjusted. No special tools are required to dismantle the unit.

It has been found from experience that the best air pressure is that which will allow the piston to rest at 75 per cent. of full extension when carrying normal static load. This figure

allows the piston readily to respond to small increases or decreases of the ground reaction when taxi-ing. The strut is designed normally for use as a simple member under axial compression loads, and usually has pin-jointed or ball-jointed end attachments.

In order to meet the demand of new types of retractable undercarriages fitted with brakes, modified designs have been tested which permit the piston to operate efficiently when under bending loads in one or two planes. Experience has also been gained with installations in which the piston acts as a full cantilever and has a splined internal engagement with the air cylinder. It has been proved that the gland does not leak when the strut is on its side or when inverted.

WAKEFIELD SCHOLARSHIPS AT CHELSEA COLLEGE

Viscount Wakefield has again presented scholarships to the value of £500 to the Chelsea Automobile and Aeronautical Engineering Colleges—two in each branch. Applications for particulars of these scholarships should be made to the Secretary of the College at Chelsea. The examinations will be held next month, and the successful candidates will begin training in October.

SLINGSBY SAILPLANES

The firm of Slingsby, Russell and Brown, Ltd., of Kirbymoor-side, Yorkshire, has now completed its organisation, and its aircraft side will be known as Slingsby Sailplanes.

Twelve machines are in course of construction. Four are of the "British Falcon" type, one is a side-by-side two-seater dual-control model, another is a high-performance machine to the design of Flt. Lt. Buxton, four are of the Gruman "Baby II" type, and two are primary trainers.

The side-by-side two-seater is an entirely new type, and is being built for the Midland Gliding Club. All machines are tested by Mr. Slingsby before handing over.

A TRADE AIRCRAFT DIRECTORY

"Planes Directory of the Aviation and Allied Industries" is the imposing title of a volume which has just been published by Planes Publishers, Ltd., 4, Johnson's Court, London, E.C.4. This book is divided into sections: Commercial, Brand and Trade Names, General, Classified Trades, Overseas and Foreign, General Information.

The information contained in this book should be of great value to all those interested in the aviation industry. As the publishers point out, there are bound to be omissions and errors, but it is hoped that those concerned will rectify these so that subsequent editions may be of even greater value.



NEW COMPANIES.

AIR SALES AND SERVICE, LTD. Capital, £5,000 in £1 shares. Objects: to acquire property and assets of The Kent Flying Club and carry on business of carriers of passengers and goods by air. First directors: Robert C. Ramsay and Alexander Ramsay, Howletts, Bekesbourne, Kent; John H. Barringer.

BRITISH-AMERICAN AIR SERVICES, LTD. Nominal capital, £5,000 in 1s. shares. Objects: to operate air services in any part of the world. Subscribers (each with one ordinary share) are: B. Beevor and S. H. Thomas, 18, Austin Friars, London, E.C.2.

UNITED AIRWAYS, LTD. Nominal capital, £50,000 in £1 shares. Objects: to operate air lines in any part of the world; to establish and maintain aviation clubs and schools, etc. Subscribers: John de C. Ballardie, 2, The Terrace, Richmond, Surrey; Wm. D. L. Roberts, Kensington Palace Mansions, London, W.8.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motors (The numbers in parentheses are those under which the specification will be printed and abridged, etc.)

- Published April 18, 1935.
- 16863. BENDIX AVIATION CORPORATION. Torque amplifiers for indicating, measuring, or regulating instruments. (425,599.)
 - 18034. BENDIX AVIATION CORPORATION. Devices responsive to angular movement. (425,890.)
 - 26474. MIDDLETON, O. T. Propeller for aeroplanes or the like. (425,014.)
 - 33841. PULLIN & CO., LTD., R. B., and PENGELLY, C. G. Inclometers of accelerometers. (425,713.)
 - 2443. BONN, C. R. H. Epicyclic variable-speed gearing. (425,929.)
 - 4028. VAREY AVIATION Co., LTD., and LOBELLE, M. J. O. Aircraft. (425,645.)
 - 8542. BOCK, G. A. Driving the propellers of aircraft. (425,649.)
 - 22699. EBERHART, R. Flying-machine with oscillating wings. (425,949.)
 - 23142. BONGIOVANNI, L. Device for reversing the propeller of aircraft. (425,870.)
 - 31560. SPERRY GYROSCOPE Co., INC. Gyroscopic apparatus for use on aircraft. (425,957.)
 - 13784. FAIRY AVIATION Co., LTD., HOLROYD, F., and EBBUTT, C. G. W. Mounting of guns on aircraft. (425,766.)

FLIGHT

MISCELLANEOUS ADVERTISEMENTS

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Aircraft and Engines For Sale

KLEMM 2-SEATER. British Salmson engine. 2 magnetos, large wheel undercarriage. 250 hours. 5 hours since top overhaul and re-paint. Very clean aircraft. £225 or near offer. Beardmore Service, Ltd., 28, Queen's Road, W.2.

FOR Sale. 40 h.p. Salmson Klemm, cruises 70. C. of A. November, 30 hrs. since top overhaul and C. of A. £225. R. Somerset, North Eastern Airways, Heston.

DE HAVILLAND Fox Moth, Gipsy Major. 12 months C. of A. Completely fitted night flying. Turn and bank indicator. Air log Hours 274. £695. Box No. 1049, c/o "Flight," Dorset House, Stamford Street, London, S.E.1.

GIPSY Major British Klemm "Eagle." Only flown 50 hours since new in September 1934. C. of A. to April 1936. Airframe and engine fully modified. Fitted with large airwheels, luminous instruments, special compass, navigation lights, etc. Apply Malcolm & Farquharson, Ltd., "Agents for British-Klemm Aeroplanes," Heston Airport. Hounslow 2345.

BRITISH Klemm "Swallow." 12 months C. of A. New in June 1934. British Salmson 75 h.p. engine, only 20 hours since completely overhauled and modified by makers. Special paintwork and extra instruments. Apply Malcolm & Farquharson, Ltd., "Agents for British-Klemm Aeroplanes," Heston Airport. Hounslow 2345.

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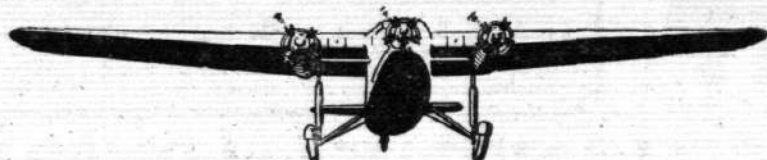
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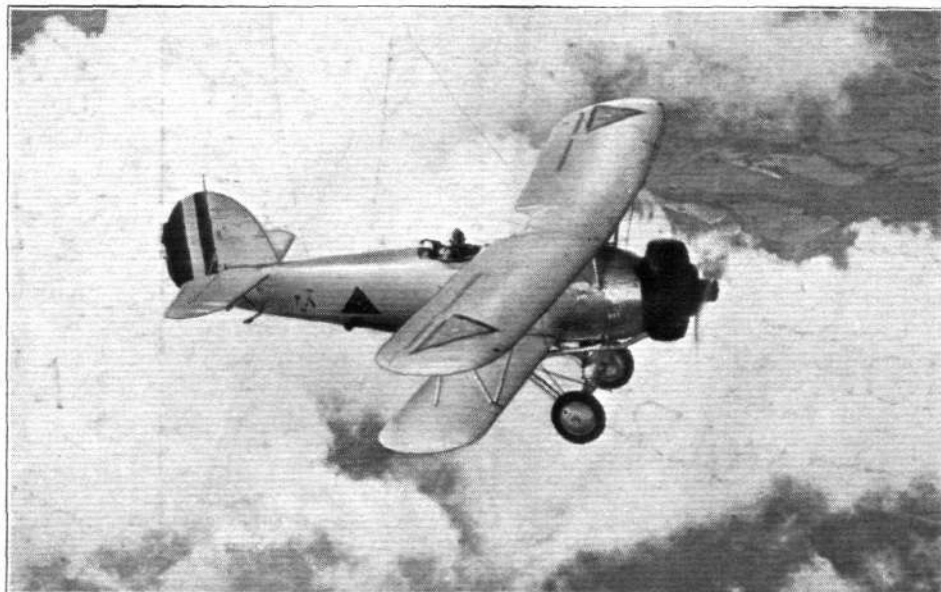
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